HVR-MRC1

SERVICE MANUAL

Ver. 1.2 2009.03
Revision History

Revised-2

Replacement of the previously issued
SERVICE MANUAL 9-852-266-12
with this manual.



US Model
Canadian Model
AEP Model
E Model
Chinese Model
Japanese Model

Link

SPECIFICATIONS	FRAME SCHEMATIC DIAGRAM	REPAIR PARTS LIST
SERVICE NOTE	SCHEMATIC DIAGRAMS	ADJUSTMENTS
DISASSEMBLY	PRINTED WIRING BOARDS	INSTRUCTION MANUAL
BLOCK DIAGRAMS		

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MEMORY RECORDING UNIT

SONY®

HVR-MRC1
9-852-266-13

Sony EMCS Co.

2009C0500-1

Published by Kohda TEC

Self Diagnosis Supported model

PROGRESSIVE

SPECIFICATIONS

System

File system	FAT32	
CompactFlash	133x 2 GB or more The capacity is the value when 1 GB equals 1 billion bytes. The actual usable capacity may be slightly less because administrative files etc. are included.	
File format	HDV recording	MPEG-2TS (.m2t)
	DVCAM/DV recording	AVI-Type1 (.AVI) RAW DV (.DV)
Input signal		
HDV recording/playback		
Video:	MPEG-2TS 1080/60i, 30p, 24p 1080/50i, 25p	
Audio:	2 CH MPEG 1 Audio Layer2 Stereo (16 bit 48 kHz) (1/2 CH) 4 CH MPEG 2 Audio Layer2 Stereo (16 bit 48 kHz) (3/4 CH)	
DVCAM/DV recording/playback		
Video:	DV embedded	
Audio:	PCM digital (12/16 bit, 32k, 48k)	
Recordable time	2 GB	Approx. 9 minutes
	4 GB	Approx. 18 minutes
	8 GB	Approx. 36 minutes
	16 GB	Approx. 72 minutes

General

Power requirement	DC 7.2 V (battery pack) DC 8.4 V (AC adaptor)
Power consumption	2.2 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	–20 °C to +60 °C (–4 °F to +140 °F)
Operating humidity	20 % (20 °C) to 90 % (35 °C) (no condensation)
Dimensions	
HVR-MRC1 :	Approx. 57 × 102 × 34 mm (2 1/4 × 4 × 1 3/8 in.)
HVR-MRC1+HVRA-CR1:	Approx. 77 × 106 × 51 mm (3 × 4 1/8 × 2 in.) (including the projecting parts) (w/h/d)
Mass	
HVR-MRC1 :	Approx. 130 g (4.5 oz)
HVR-MRC1+HVRA-CR1:	Approx. 210 g (7.4 oz) (excluding CompactFlash and battery pack)
Input/output jack	i.LINK (IEEE1394 6-pin connector S400)
Optional accessories	AC adaptor/charger AC-VQ1050B Battery pack NP-F570/F770/F970

Design and specifications are subject to change without notice.

自己診断搭載機種 PROGRESSIVE

概略仕様

システム

ファイルシステム　FAT32

コンパクトフラッシュ 133x 2 GB以上
容量は、1 GBを10億バイトで計算した場合の数値です。
また管理用ファイルなどを含むため、実際使用できる容量は若干減少する場合があります。

ファイルフォーマット HDV記録時　MPEG-2TS(.m2 t)
DVCAM/DV記録時
AVI-Type1(.AVI)
RAW DV(.DV)

対応入力信号

HDV記録再生時　ビデオ:　MPEG-2TS
1080/60i , 30p , 24p
1080/50i , 25p
オーディオ: 2CH　MPEG1 Audio
Layer2 Stereo
(16bit 48KHz)
(1/2CH)
4CH　MPEG2 Audio
Layer2 Stereo
(16bit 48KHz)
(3/4CH)

DVCAM/DV記録再生時
ビデオ:DV embedded
オーディオ: PCMデジタル
(12/16 bit,32k,48k)

録画可能時間　2GB　約9分
4GB　約18分
8GB　約36分
16GB　約72分

電源部・その他

電源電圧　バッテリー端子入力 7.2 V
DC端子入力　8.4 V

消費電力　2.2 W

動作温度　0 °C～ 40 °C

保存温度　-20 °C～+60 °C

動作湿度　20 %(20 °C)～90 %(35 °C)
(結露がないこと)

外形寸法　HVR-MRC1:
約57×102×34 mm
HVR-MRC1+HVRA-CR1:
約77×106×51 mm
(最大突起部を含む)
(幅/高さ/奥行き)

質量　HVR-MRC1:約130ｇ
HVR-MRC1+HVRA-CR1:約210ｇ
(コンパクトフラッシュ、バッテリー含まず)

入力出力端子　i.LINK(IEEE1394 6ピンコネクター S400)

別売アクセサリー　ACアダプター/チャージャー AC-VQ1050
アクセサリーキット　ACCKIT-D11B
バッテリーパック　NP-F570/F770/F970

本機の仕様および外観は、改良のため予告なく変更することがありますが、ご了承ください。

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

LF : LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

サービス，点検時には次のことにご注意下さい。

1. **注意事項をお守りください。**
   サービスのとき特に注意を要する個所については，キャビネット，シャーシ，部品などにラベルや捺印で注意事項を表示しています。これらの注意書き及び取扱説明書等の注意事項を必ずお守り下さい。
2. **指定部品のご使用を**
   セットの部品は難燃性や耐電圧など安全上の特性を持ったものとなっています。従って交換部品は，使用されていたものと同じ特性の部品を使用して下さい。特に回路図，部品表に⚠印で指定されている安全上重要な部品は必ず指定のものをご使用下さい。
3. **部品の取付けや配線の引きまわしはもとどおりに**
   安全上，チューブやテープなどの絶縁材料を使用したり，プリント基板から浮かして取付けた部品があります。また内部配線は引きまわしやクランパによって発熱部品や高圧部品に接近しないよう配慮されていますので，これらは必ずもとどおりにして下さい。
4. **サービス後は安全点検を**
   サービスのために取外したネジ，部品，配線がもとどおりになっているか，またサービスした個所の周辺を劣化させてしまったところがないかなどを点検し，安全性が確保されていることを確認して下さい。
5. **チップ部品交換時の注意**
   - 取外した部品は再使用しないで下さい。
   - タンタルコンデンサのマイナス側は熱に弱いため交換時は注意して下さい。
6. **フレキシブルプリント基板の取扱いについて**
   - コテ先温度を270℃前後にして行なって下さい。
   - 同一パターンに何度もコテ先を当てないで下さい。（3回以内）
   - パターンに力が加わらないよう注意して下さい。
7. **無鉛半田について**
   無鉛半田を使用している基板には，無鉛（Lead Free）を意味するレッドフリーマークがプリントされています。
   （注意：基板サイズによっては，無鉛半田を使用していてもレッドフリーマークがプリントされていないものがあります）
   ：レッドフリーマーク
   無鉛半田には，以下の特性があります。
   - 融点が従来の半田よりも約40℃高い。
     従来の半田こてをそのまま使用することは可能ですが，少し長めにこてを当てる必要があります。
     温度調節機能のついた半田こてを使用する場合，約350℃に設定して下さい。
     注意：半田こてを長く当てすぎると，基板のパターン（銅箔）がはがれてしまうことがありますので，注意して下さい。
   - 粘性が強い
     従来の半田よりも粘性が強いため，IC端子などが半田ブリッジしないように注意して下さい。
   - 従来の半田と混ぜて使用可能
     無鉛半田には無鉛半田を追加するのが最適ですが，従来の半田を追加しても構いません。

1. SERVICE NOTE

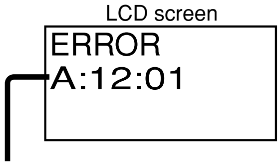
1-1. POWER SUPPLY DURING REPAIRS

In this unit, about 10 seconds after power is supplied to the battery terminal using the regulated power supply (8.4V), the power is shut off so that the unit cannot operate.
These following method is available to prevent this.

Method:
Use the DC input terminal. (AC power adaptor/changer (AC-VQ1050B) and DK cable).

1-2. SELF-DIAGNOSIS FUNCTION

When an error occurs the following warning indicators may appear on the LCD screen.
And this unit is sent error code to camera.



Self-diagnosis display: X:Yy:ZZ

X	
i LINK	I:
ATA	A:
Power Supply	P:
MPEG/AVI	M:
Other	X:
Fatal Error	F:

Y	
Main	1y
Sub	2y
Other	9y

y	
Physical	Y1
Logical	Y2
Other	Y9

ZZ
When error is defined in the devise, the error code of it is displayed.

Self-diagnosis Code			Cause	Corrective Action
X	Yy	ZZ		
A	12	01	Cash overflow by transfer rate delay of CompactFlash.	Be sure that the CompactFlash you are using is the recommended type.
A	12	02	The selection clip is not found.	Be sure that the CompactFlash you are using is the recommended type.
A	12	03	The filesystem of CompactFlash is broken.	Reformat the CompactFlash using this unit again, after reformatting the CompactFlash using personal computer.
A	19	91	CompactFlash recognition error	Check the type you are using.
I	12	**	Error related to i.LINK	Turn this unit off and then back on.
P	12	**	It is generated the error by the power supply control from main CPU to sub CPU.	Turn this unit off and then back on.
P	21	01	It is generated the error by the power supply control from sub CUP to each device.	Turn this unit off and then back on.
P	21	02	It could not enter to the sleep mode.	Turn this unit off and then back on.
M	12	**	The input video stream is abnormal.	Turn this unit off and then back on.
M	21	**	The recording animation could not correctly treat.	Turn this unit off and then back on.
F	11	01	Communication abnormality between CompactFlash and main CPU.	Turn this unit off and then back on.
F	11	02	i.LINK error.	Turn this unit off and then back on.
F	12	**	It abnormal is generated by the file system.	Reformat the CompactFlash using this unit.
F	20	01	Reset failure of PHY (Physical Layer)	There is particularly no solution
F	21	**	Main CPU cannot be communicated with sub CPU.	Turn this unit off and then back on.
F	22	**	Sub CPU cannot control each device.	Turn this unit off and then back on.
F	29	00	Sub CPU farm is not written.	Turn this unit off and then back on.
F	91	**	Fatal error of originating hardware.	Turn this unit off and then back on.
F	92	**	Fatal error of originating software.	Turn this unit off and then back on.
X	91	85	Reception buffer overflow.	Turn this unit off and then back on.
X	99	**	Error code of main CPU firmware.	Turn this unit off and then back on.

Note: ** is arbitrary value.

1-1. 修理時の電源供給について

本機では，安定化電源（8.4Vdc）からバッテリ端子に電源を供給した場合，約 10 秒後にシャットオフし，動作しなくなります。
これを避けるため，下記の方法を用いてください。

方法:
DC入力端子を使用する。（ACアダプタ/チャージャ（AC-VQ1050）とDKケーブルを使用する。）

1-2. 自己診断機能

エラーが発生した場合は，エラー内容に合わせて LCD 画面にエラーコードが表示されます。
また，カメラ側にエラーコードが送信されます。

LCD画面



自己診断表示：X:Yy:ZZ

X	
i.LINK	I:
ATA	A:
電源	P:
MPEG/AVI	M:
その他	X:
致命的なエラー	F:

Y	
メイン	1y
サブ	2y
その他	9y

y	
フィジカル	Y1
ロジカル	Y2
その他	Y9

ZZ
デバイスにエラーの規定があれば，そのコードを表示する。

自己診断コード			原因	対処
X	Yy	ZZ		
A	12	01	コンパクトフラッシュの転送速度遅延によるキャッシュオーバーフロー。	使用のコンパクトフラッシュが推奨のカードか確認する。
A	12	02	選択クリップが見つからない。	使用のコンパクトフラッシュが推奨のカードか確認する。
A	12	03	コンパクトフラッシュのファイルシステムが壊れている。	パソコンでコンパクトフラッシュのフォーマットを行った後，本機で再度コンパクトフラッシュのフォーマットを行う。
A	19	91	コンパクトフラッシュ認識エラー。	電源を切り，再度電源を入れ直す。
I	12	**	i.LINK関連のエラー。	電源を切り，再度電源を入れ直す。
P	12	**	メインCPUからサブCPUへの電源制御でエラー発生。	電源を切り，再度電源を入れ直す。
P	21	01	サブCUPから各デバイスへの電源制御でエラー発生。	電源を切り，再度電源を入れ直す。
P	21	02	スリープモードに入れなかった。	電源を切り，再度電源を入れ直す。
M	12	**	入力ビデオストリーム異常。	電源を切り，再度電源を入れ直す。
M	21	**	記録動画を正しく処理できなかった	電源を切り，再度電源を入れ直す。
F	11	01	コンパクトフラッシュ－メインCPU間通信異常。	電源を切り，再度電源を入れ直す。
F	11	02	i.LINKエラー。	電源を切り，再度電源を入れ直す。
F	12	**	ファイルシステムで異常発生。	本機でコンパクトフラッシュのフォーマットを行う。
F	20	01	PHY（Physical Layer）のリセット失敗。	電源を切り，再度電源を入れ直す。
F	21	**	メインCPUがサブCPUとの通信ができない。	電源を切り，再度電源を入れ直す。
F	22	**	サブCPUが各デバイスを制御できない。	電源を切り，再度電源を入れ直す。
F	29	00	サブCPUファームが書き込まれていない。	特になし
F	91	**	ハードウェア起因の致命的なエラー。	電源を切り，再度電源を入れ直す。
F	92	**	ソフトウェア起因の致命的なエラー。	電源を切り，再度電源を入れ直す。
X	91	85	受信バッファオーバーフロー。	電源を切り，再度電源を入れ直す。
X	99	**	メインCPUファームウェアのエラーコード。	電源を切り，再度電源を入れ直す。

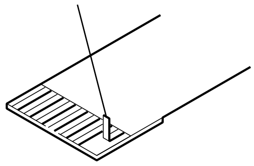
注：** は任意の値。

2. DISASSEMBLY

NOTE FOR REPAIR

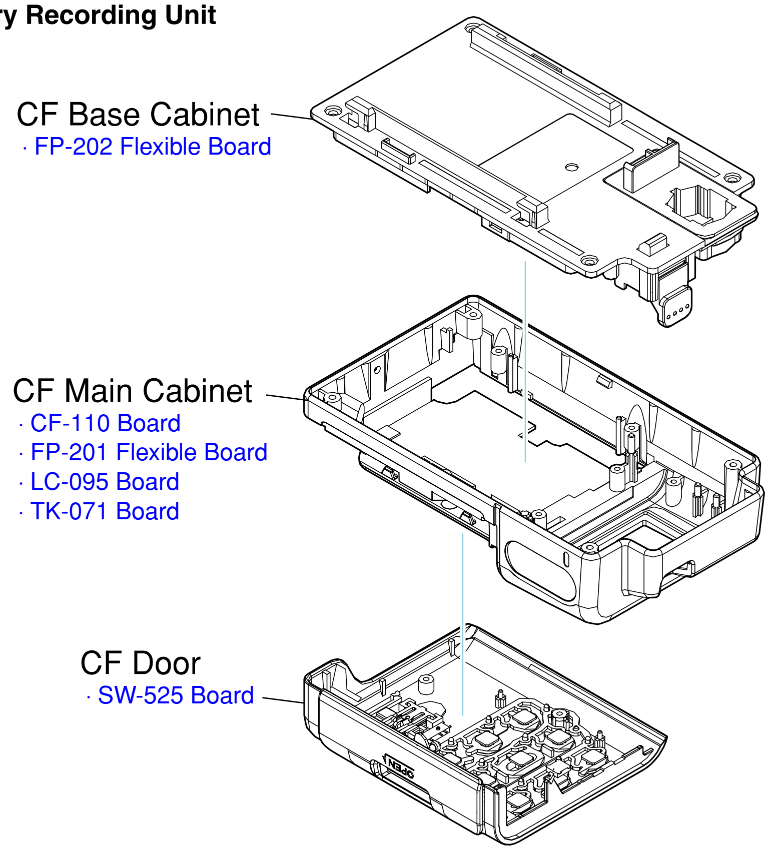
- Make sure that the flat cable and flexible board are not cracked of bent at the terminal.
  Do not insert the cable insufficiently nor crookedly.
- When remove a connector, don't pull at wire of connector. It is possible that a wire is snapped.
- When installing a connector, don't press down at wire of connector.
  It is possible that a wire is snapped.

Cut and remove the part of gilt which comes off at the point.
(Be careful or some pieces of gilt may be left inside)



2-1. IDENTIFYING PARTS

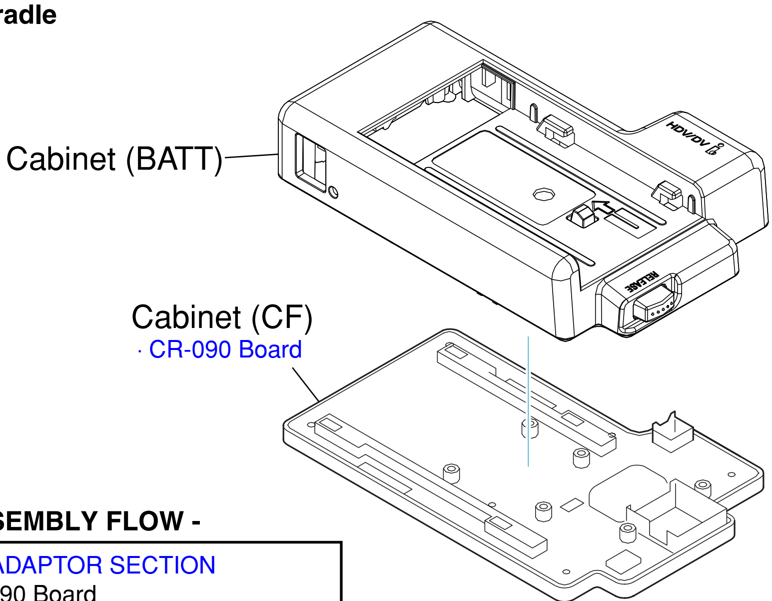
Memory Recording Unit



- DISASSEMBLY FLOW -

2-2-1. BASE CABINET SECTION		2-2-2. MAIN CABINET SECTION
· CF Base Cabinet · TK-071 Board	→	· CF-110 Board · LCD Block · SW-525 Board

i.LINK Cradle



- DISASSEMBLY FLOW -

2-2-3. ADAPTOR SECTION
· CR-090 Board · Cabinet (BATT)

HELP

2-2. DISASSEMBLY

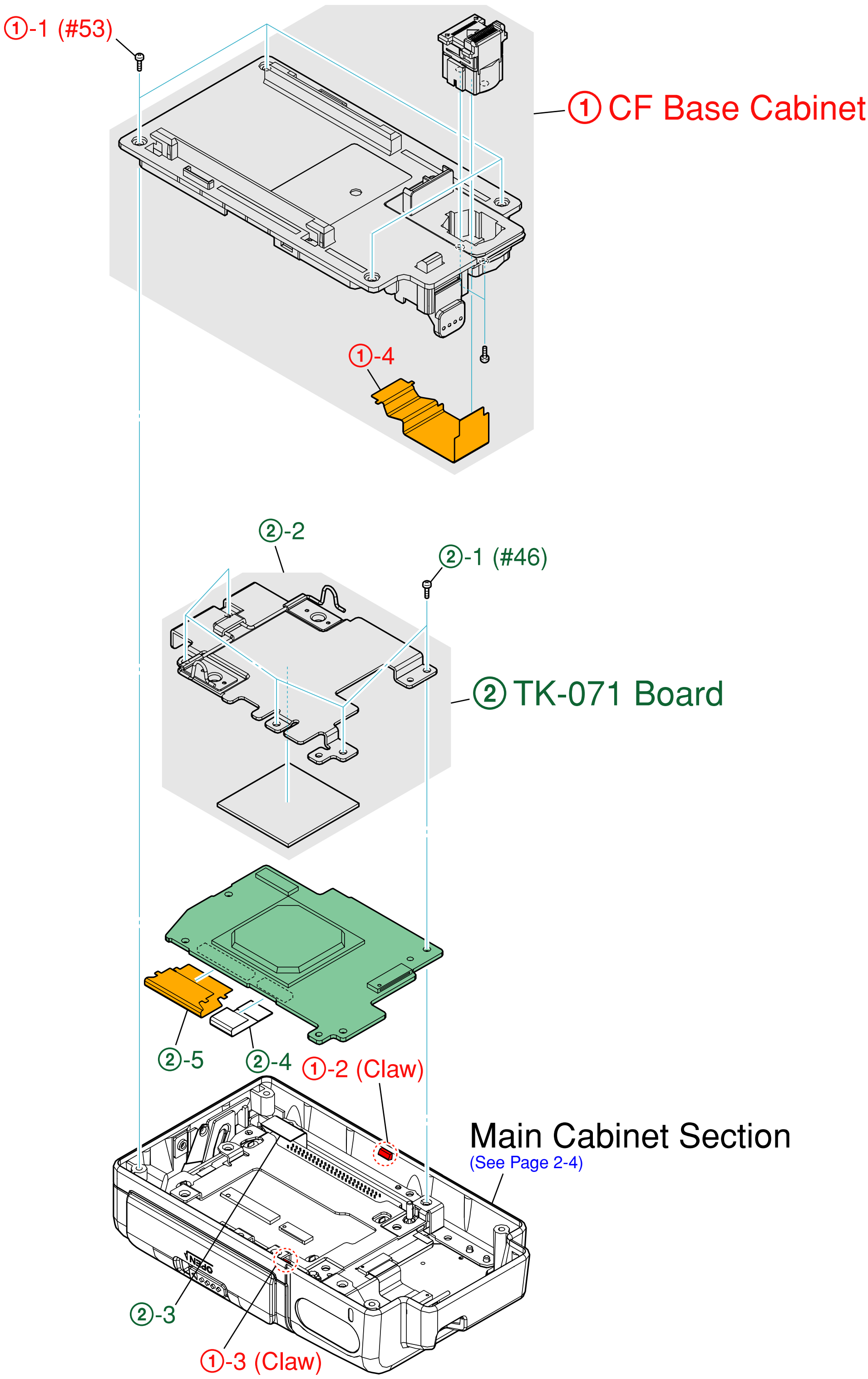
EXPLODED VIEW HARDWARE LIST

2-2-1. BASE CABINET SECTION

Follow the disassembly in the numerical order given.

① CF Base Cabinet (①-1 to ①-4)

② TK-071 Board (②-1 to ②-5)



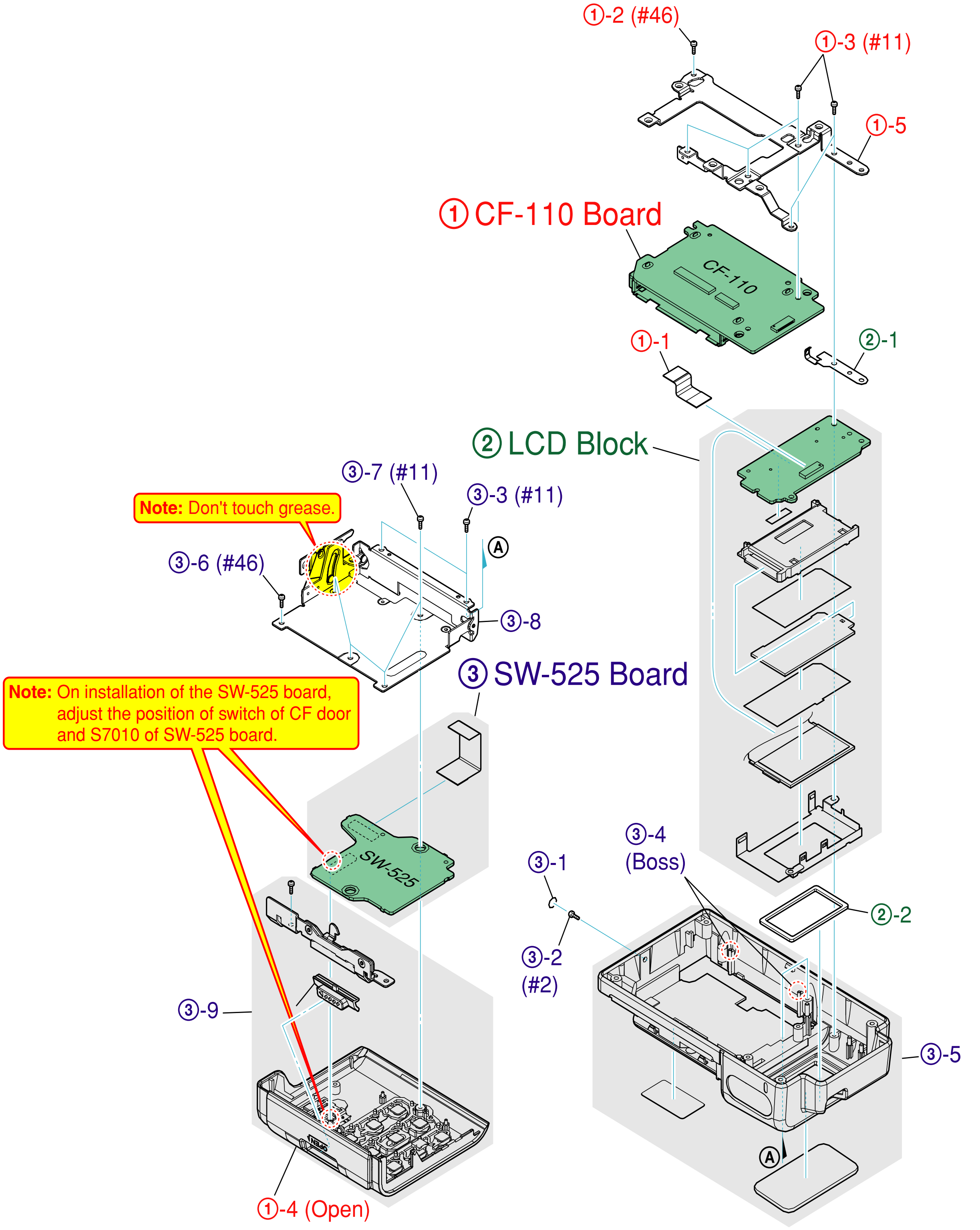
2-2-2. MAIN CABINET SECTION

Follow the disassembly in the numerical order given.

① CF-110 Board (①-1 to ①-5)
② LCD Block (②-1 to ②-2)
③ SW-525 Board (③-1 to ③-9)

EXPLODED VIEW

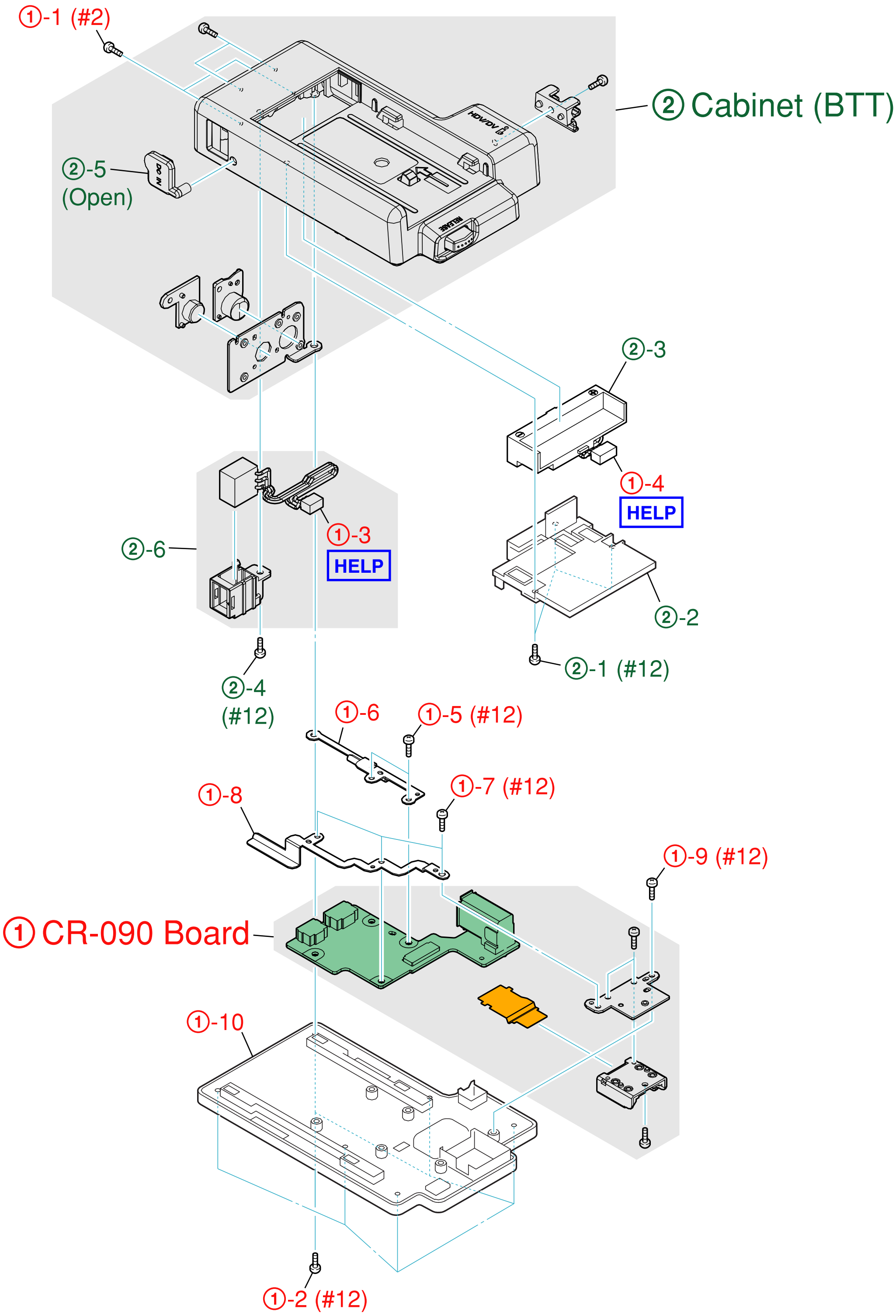
HARDWARE LIST



2-2-3. ADAPTOR SECTION

EXPLODED VIEW HARDWARE LIST

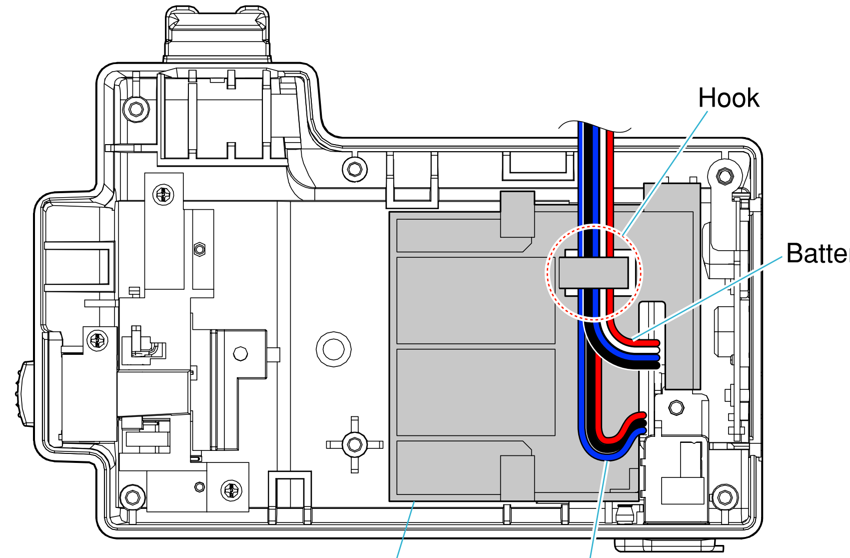
Follow the disassembly in the numerical order given.
① CR-090 Board (①-1 to ①-10)
② Cabinet (BTT) (②-1 to ②-6)



HELP

Sheet attachment positions and procedures of processing the flexible boards/harnesses are shown.

DC-IN Connector/Battery Terminal Harness



3. BLOCK DIAGRAMS

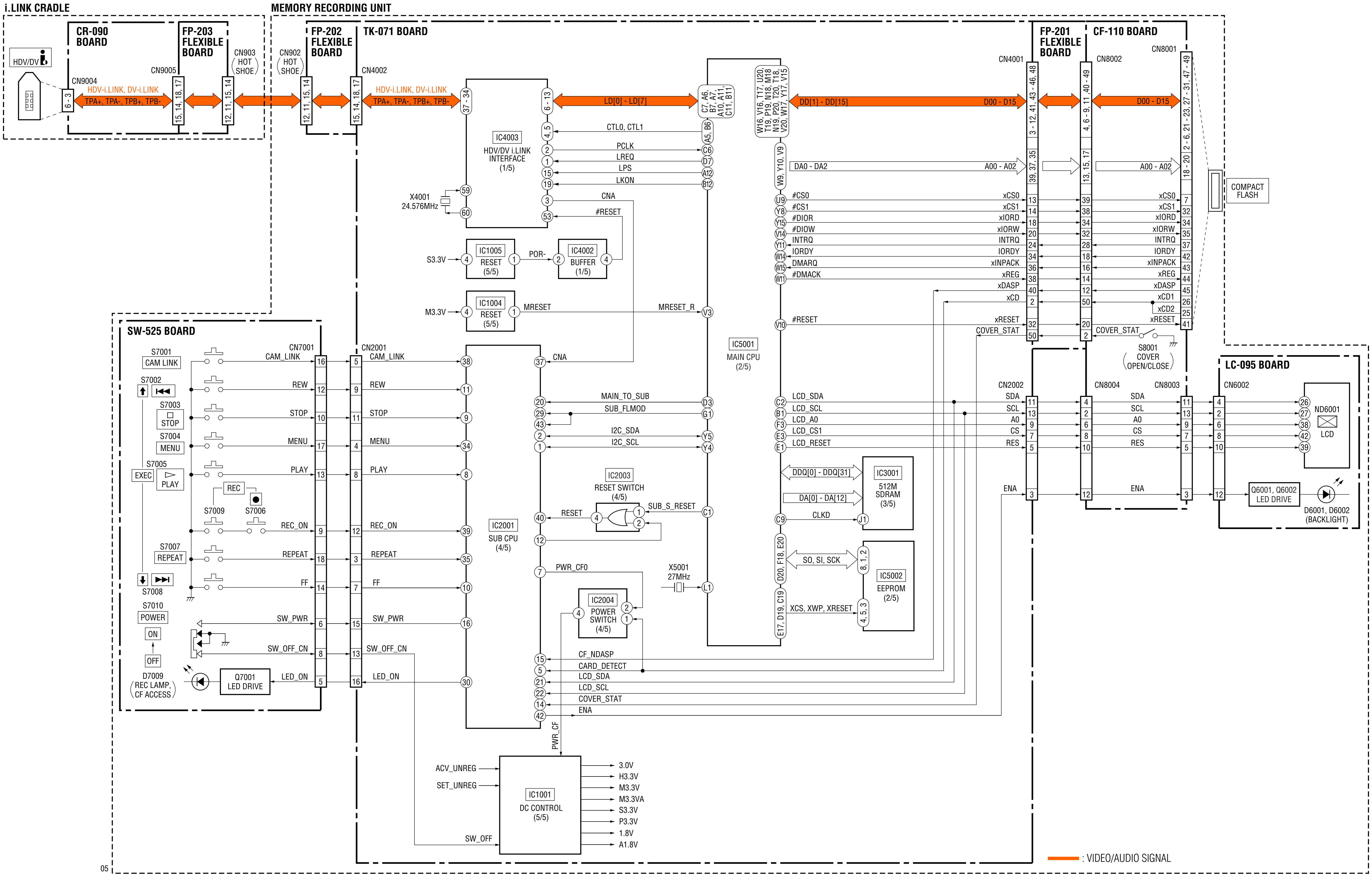
Link

OVERALL BLOCK DIAGRAM	POWER BLOCK DIAGRAM

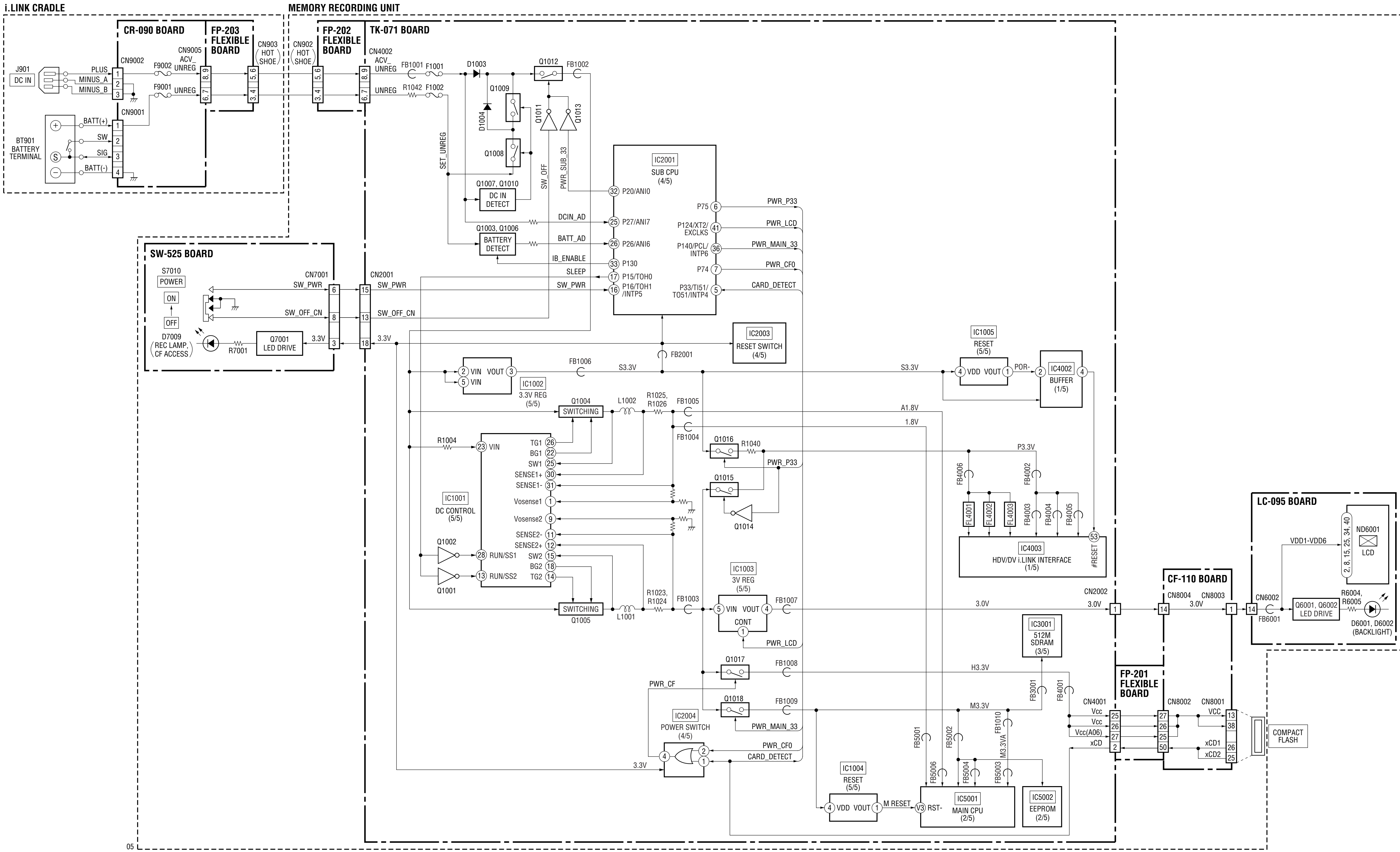
3. BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM

( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.

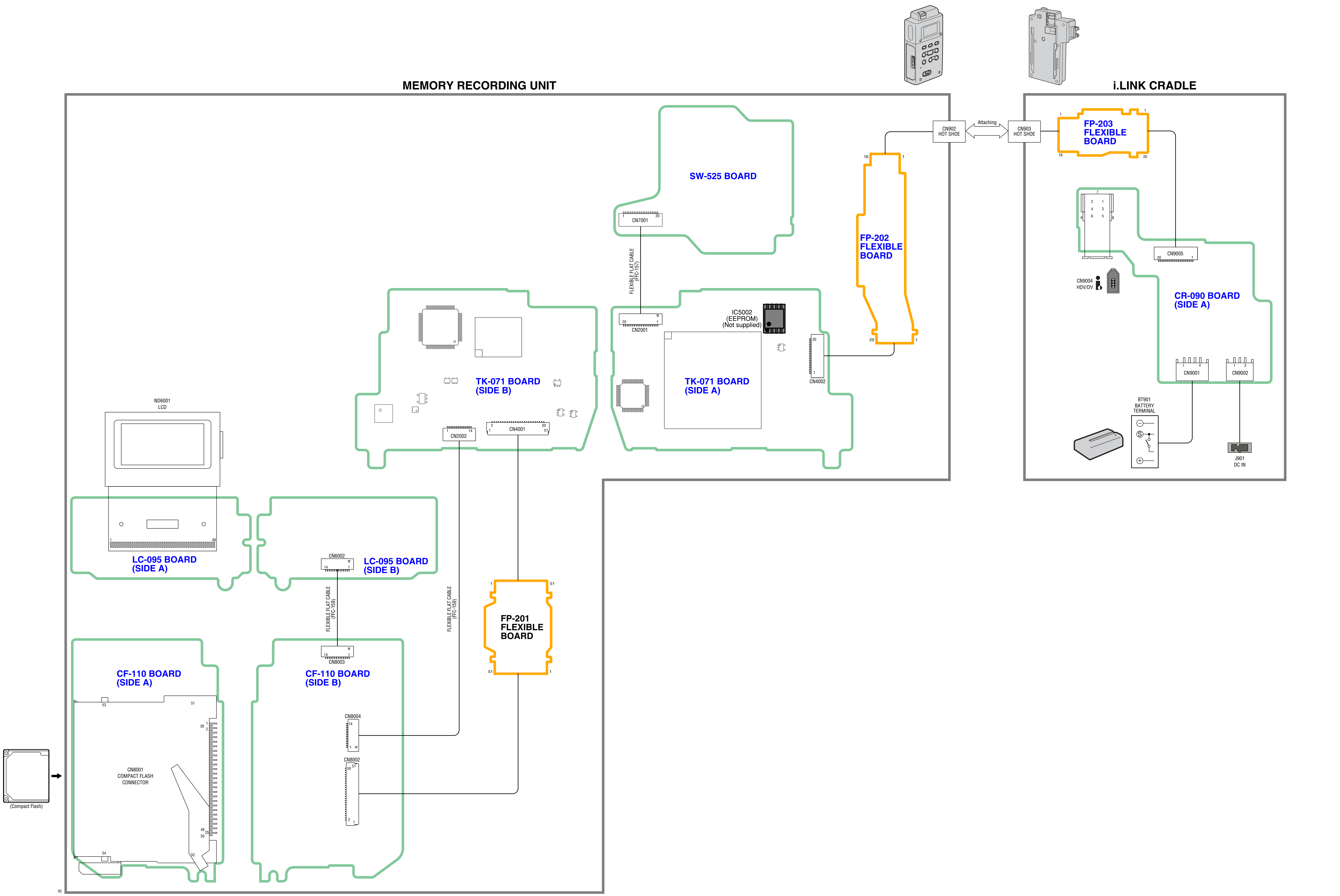


3-2. POWER BLOCK DIAGRAM ( ) : Number in parenthesis ( ) indicates the division number of schematic diagram where the component is located.



4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. SCHEMATIC DIAGRAMS

Link

4-2. SCHEMATIC DIAGRAMS (ENGLISH)

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in µF unless otherwise noted. pF : µ µF. 50 V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10 W unless otherwise noted. kΩ=1000 Ω, MΩ=1000 kΩ.
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

Example	C541	L452
	22U	10UH
	TA A	2520

TA: Kinds of capacitor; A: Case size; 2520: External dimensions (mm)

- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used. In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination. Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- : B+ Line
- : B– Line
- : IN/OUT direction of (+,–) B LINE.
- : adjustment for repair.

(Measuring conditions voltage and waveform)

- Voltages and waveforms are measured between the measurement points and ground. They are reference values and reference waveforms. (VOM of DC 10 MΩ input impedance is used)
- Voltage values change depending upon input impedance of VOM used.)

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifie.

(JAPANESE)

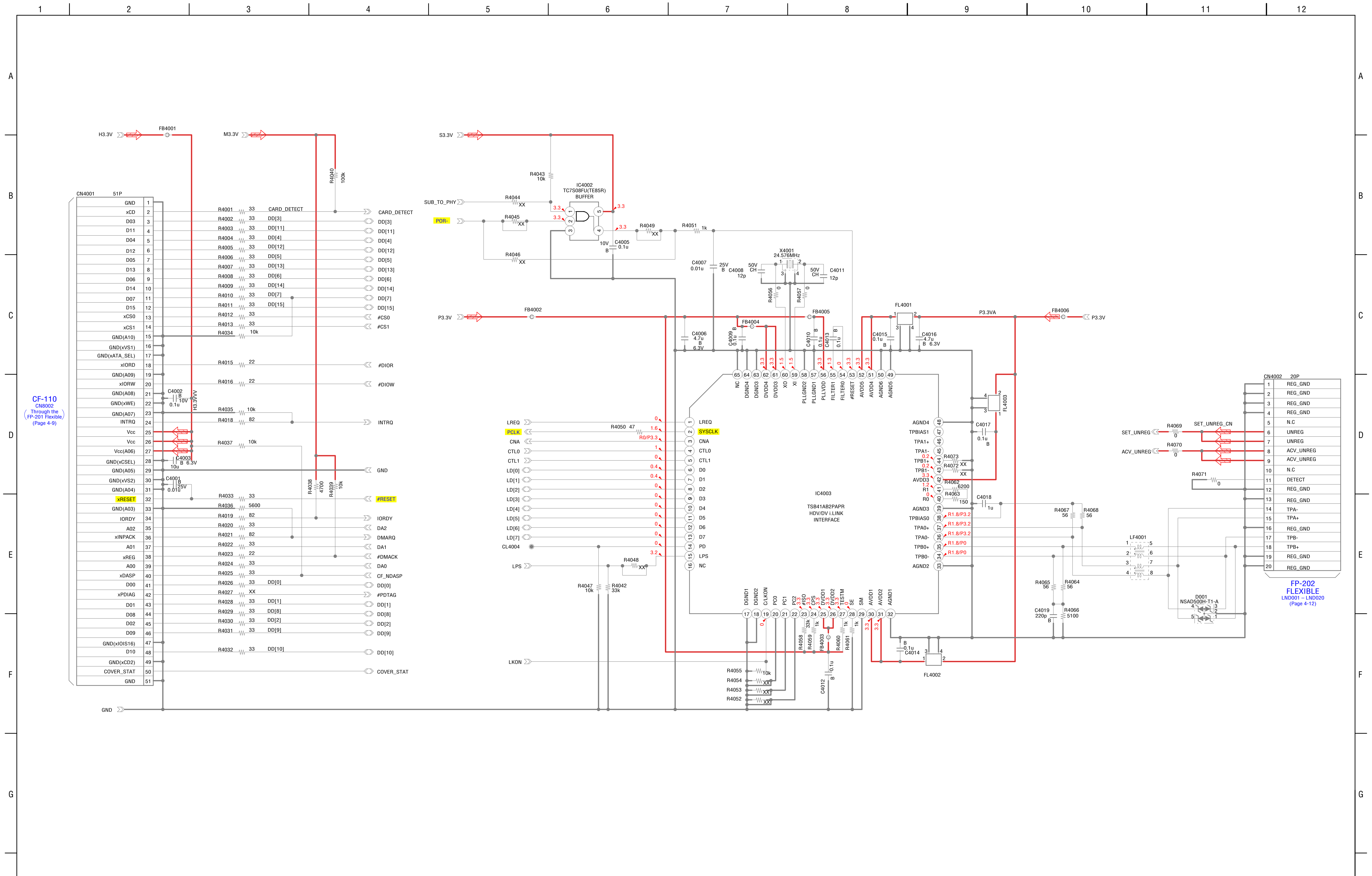
回路図共通ノート
（他に必要なノートは各ブロックに記載してあります）
【回路図ノート】
・ケミコン，タンタルを除くコンデンサで，耐圧50V以下のものはその耐圧を省略。単位はすべてμF（pはpF）。
・チップ抵抗で指示のないものは，1／10W以下。
kΩ＝1000Ω，MΩ＝1000kΩ
・チップ部品交換時の注意
取り外した部品は再使用せず，未使用の部品をご使用ください。
タンタルコンデンサのマイナス側は熱に弱いため注意してください。
・チップ部品には下記のように表示したものがあります。

例			
	C 541		L 452
	22U		10UH
	TA	A	2520
	↑	↑	↑
	種類	ケースサイズ	外形寸法（mm）

・抵抗，コンデンサ，ICなど定数にXXがあるものは，使用していない事を示しています。このため，使用していない回路が記載されている事があります。
・★印のある部品は，機種などにより異なりますので機能別マウント一覧表を参照してください。
・可変抵抗と半固定抵抗で，B特性の表示を省略。
・信号名表記について，下記のような場合があります。
XEDIT → $\overline{\text{EDIT}}$　　PB/XREC → PB/$\overline{\text{REC}}$
・は不燃性抵抗。
・はヒューズ抵抗。
・はパネル表示名称。
・はB＋ライン。
・はB−ライン。
・はBライン（＋，−）の入出力方向を示す。
・は調整名称。
【電圧・波形測定条件ノート】
・電圧値及び信号波形は測定点対アース間の参考値。
（デジタルマルチメータ；入力インピーダンス　DC10MΩ使用）
・使用テスタの入力インピーダンスにより電圧値が多少異なります。

⚠印の部品，または⚠印付きの点線で囲まれた部品は，安全性を維持するために重要な部品です。
従って交換時は，必ず指定の部品を使用して下さい。

お願い
図面番号で部品を指定するときは基板名又はブロックを併せて指定して下さい。



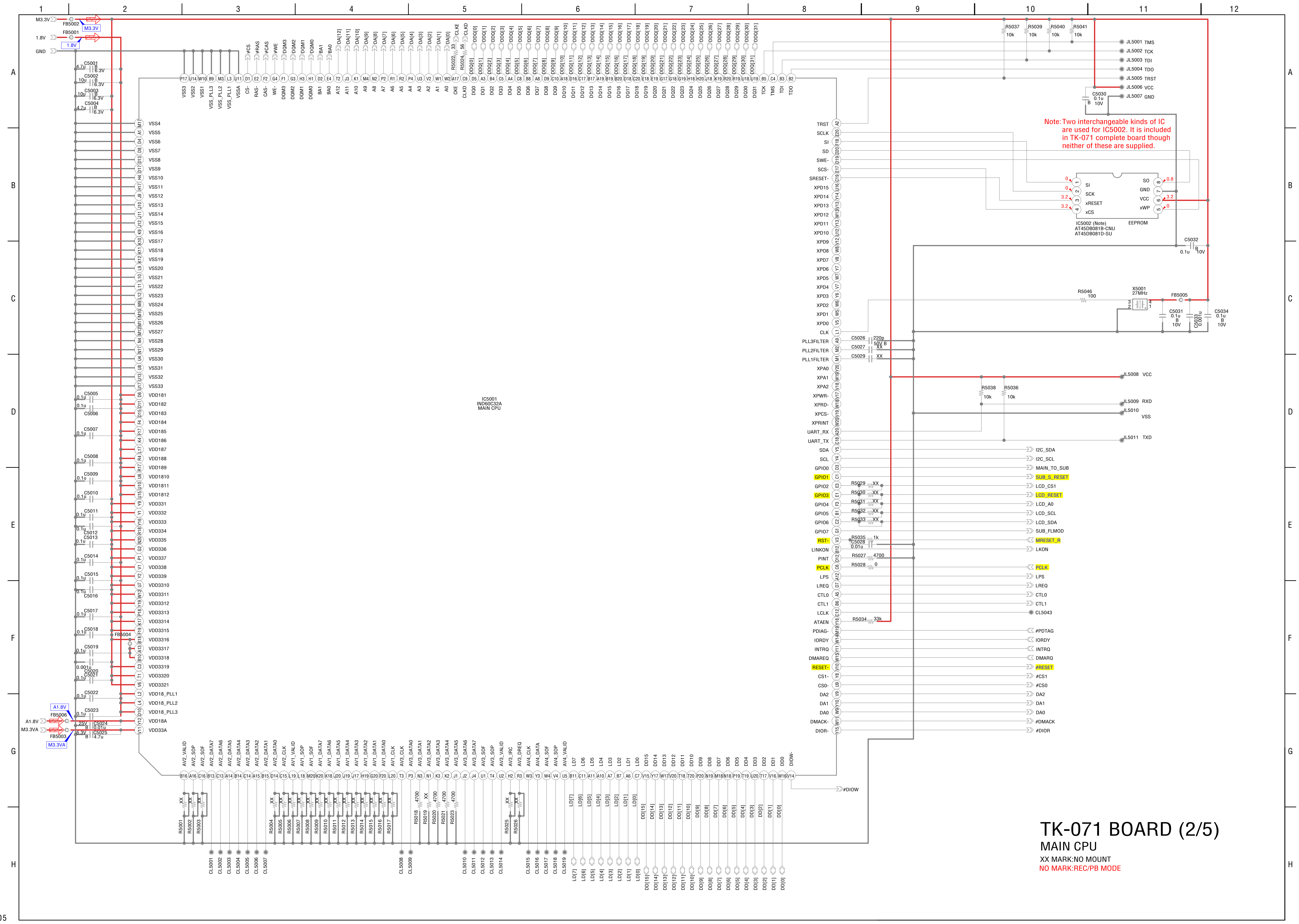
TK-071 BOARD (1/5)

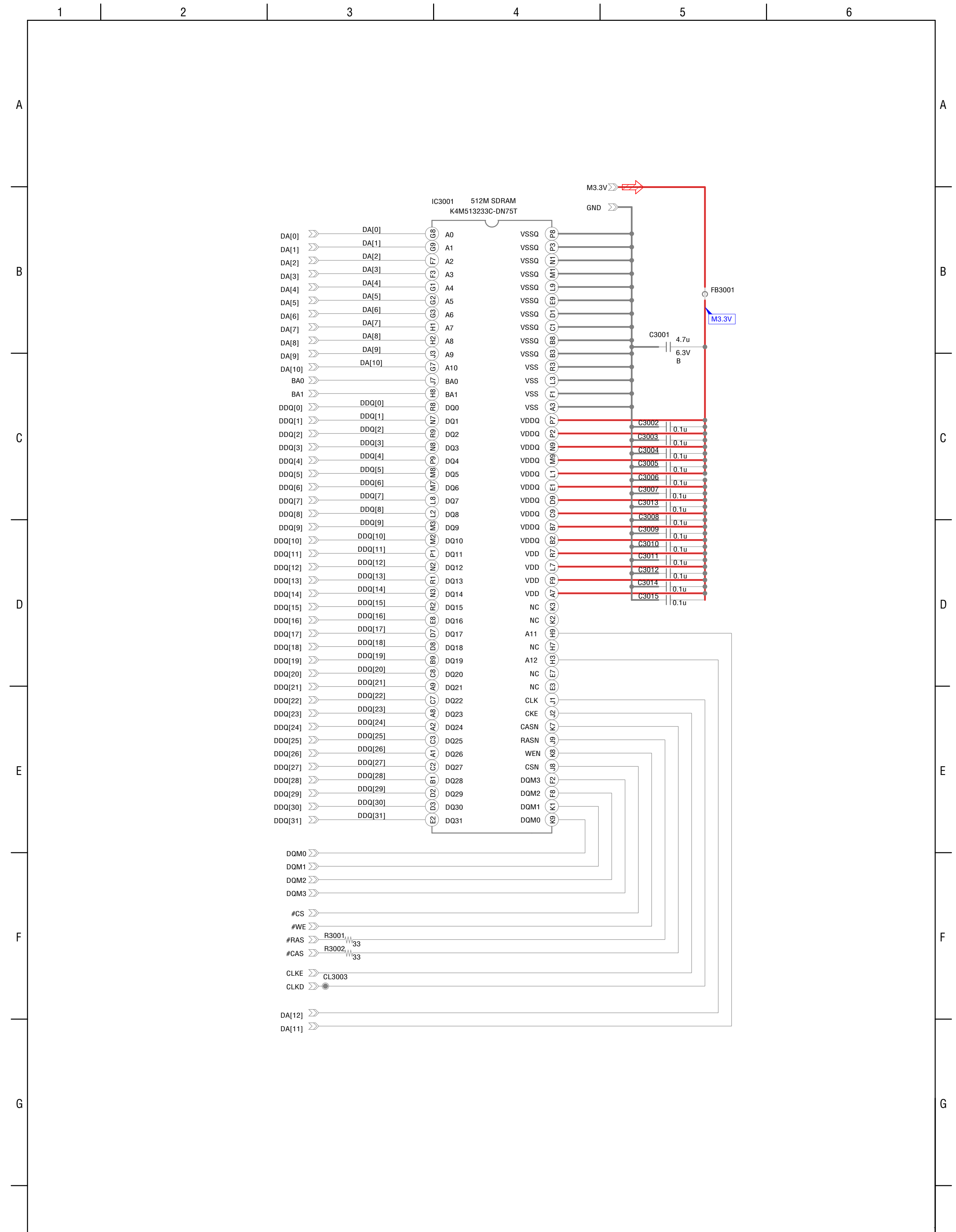
HDV/DV i.LINK INTERFACE

XX MARK:NO MOUNT

NO MARK:REC/PB MODE
R:REC MODE
P:PB MODE

05

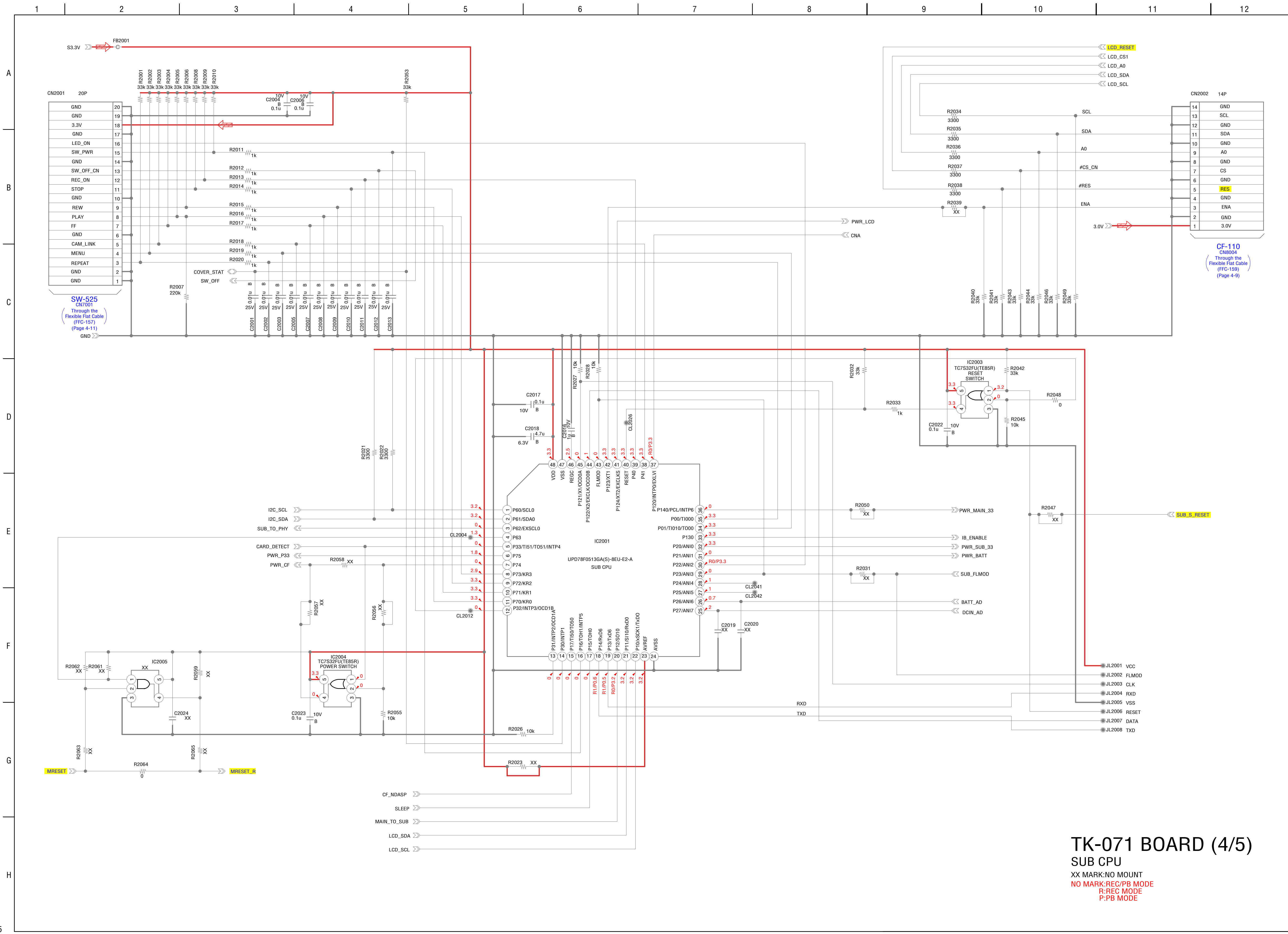

TK-071 BOARD (2/5)
MAIN CPU
XX MARK:NO MOUNT
NO MARK:REC/PB MODE
IC5001
IND60C32A
MAIN CPU
IC5002 (Note)
AT45DB081B-CNU
AT45DB081D-SU
EEPROM
Note: Two interchangeable kinds of IC are used for IC5002. It is included in TK-071 complete board though neither of these are supplied.
X5001
27MHz
M3.3V
1.8V
GND
A1.8V
M3.3VA



TK-071 BOARD (3/5)

SDRAM

05

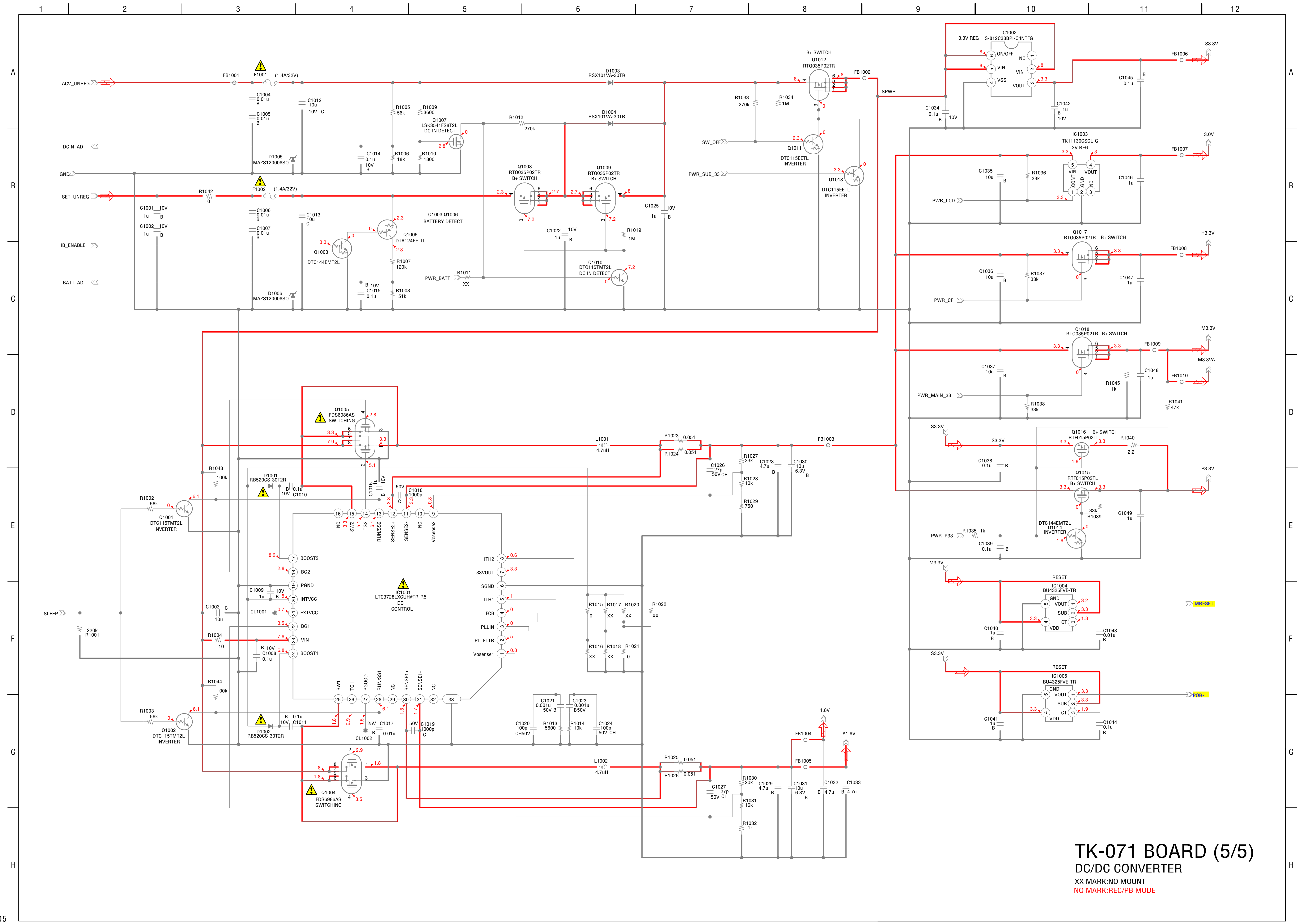


05

HVR-MRC1

TK-071 (4/5)

• Refer to page 4-2 (English), 4-3 (Japanese) for mark ⚠.



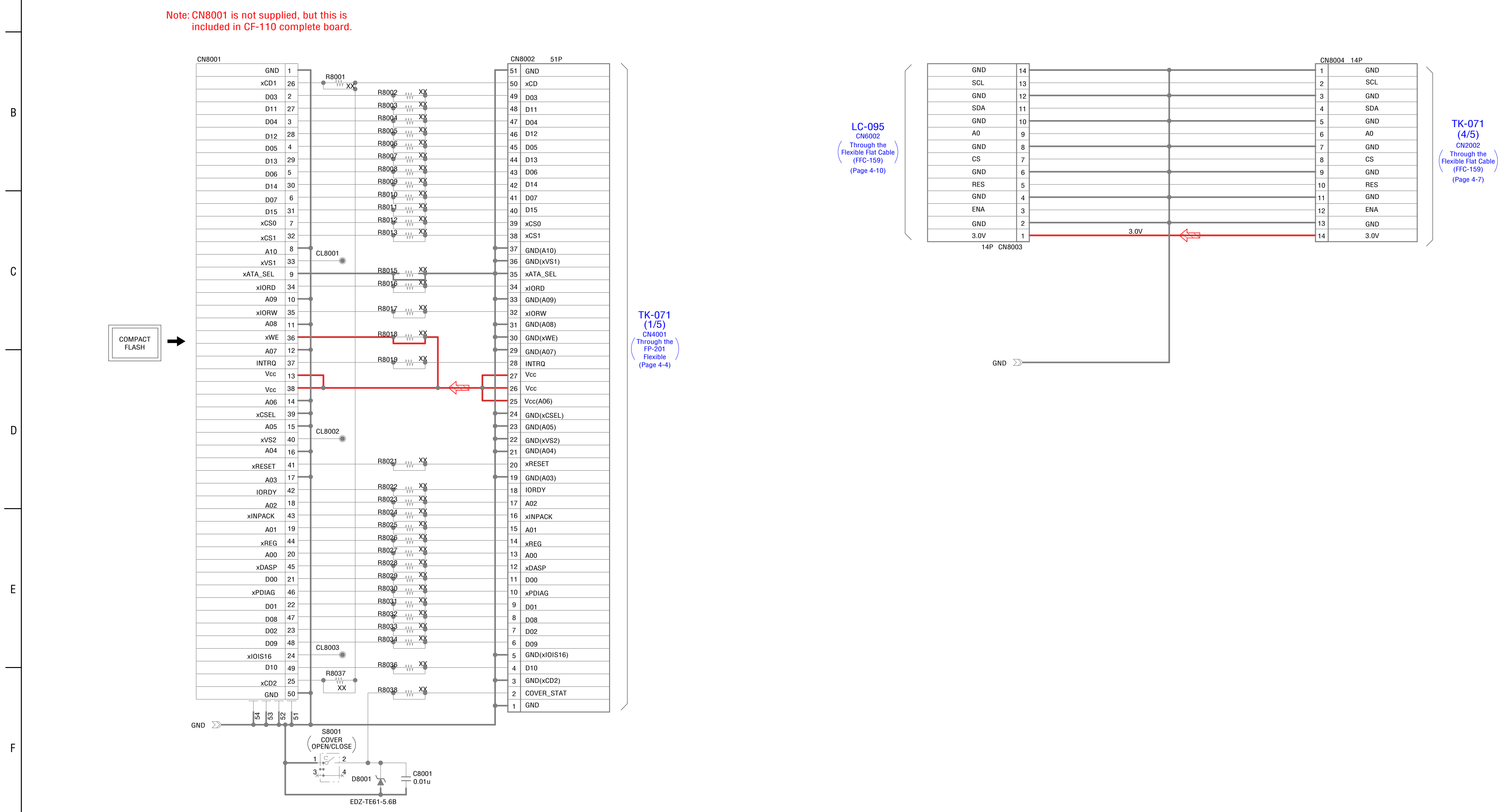
TK-071 BOARD (5/5)

DC/DC CONVERTER

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

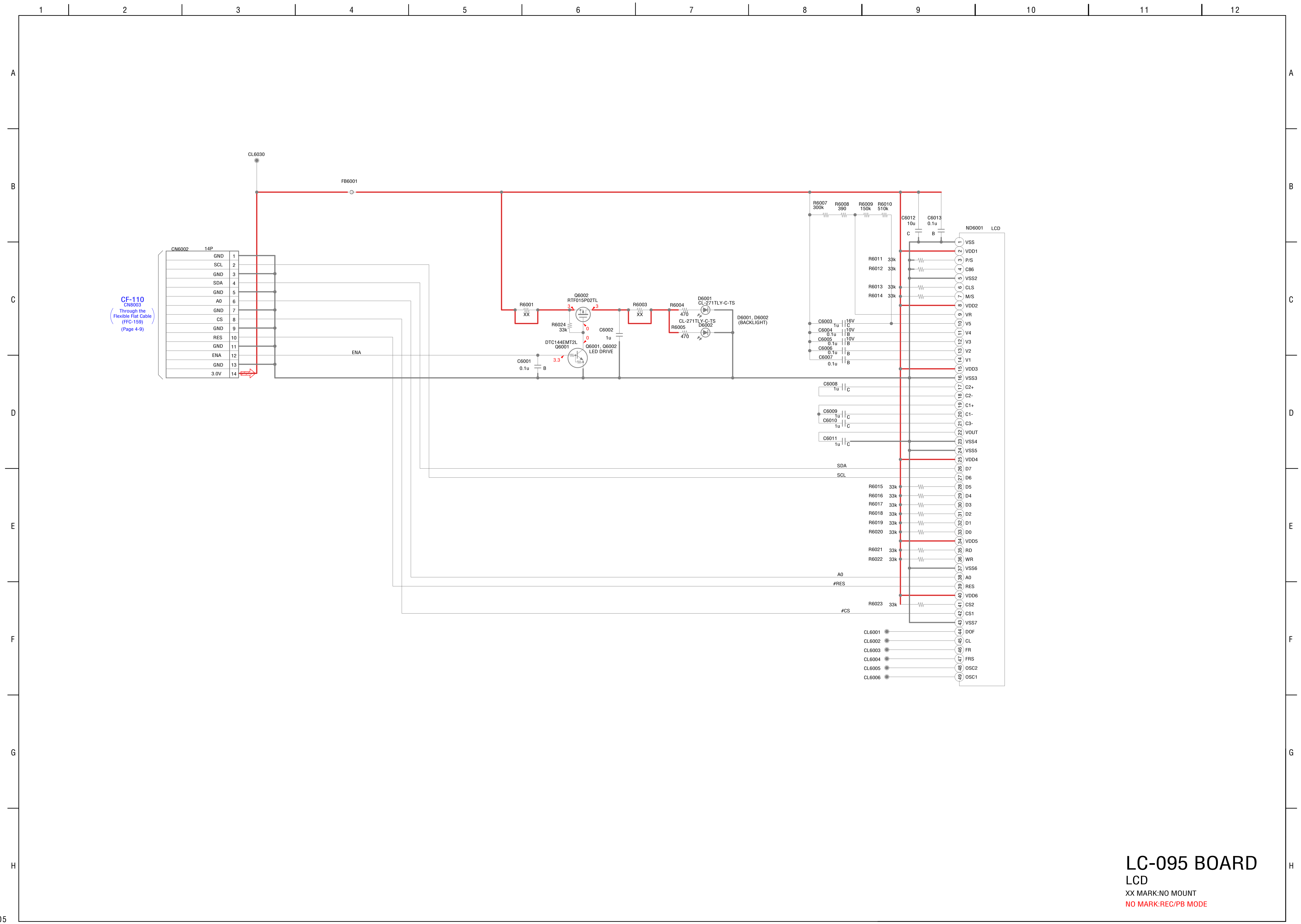
05



CF-110 BOARD

CF CONNECTOR

XX MARK:NO MOUNT

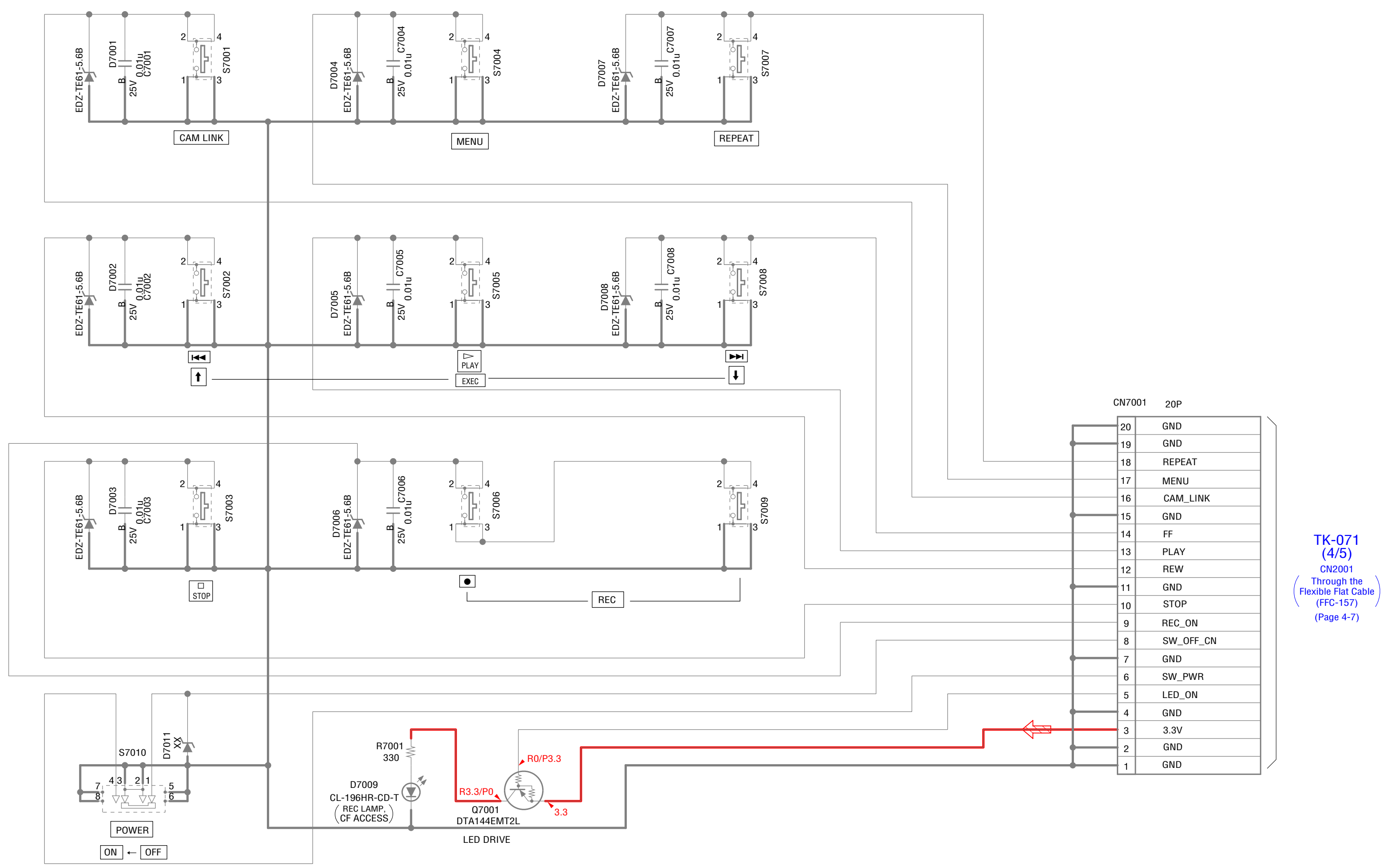


LC-095 BOARD
LCD

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

05



SW-525 BOARD

CONTROL SWITCH

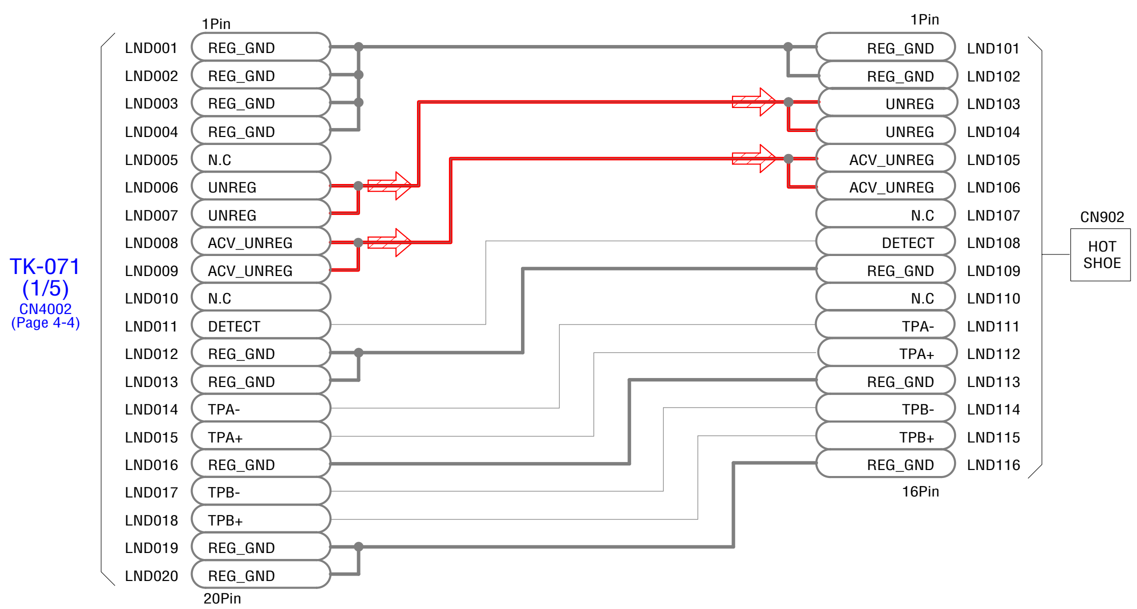
XX MARK:NO MOUNT

NO MARK:REC/PB MODE

R:REC MODE

P:PB MODE

05

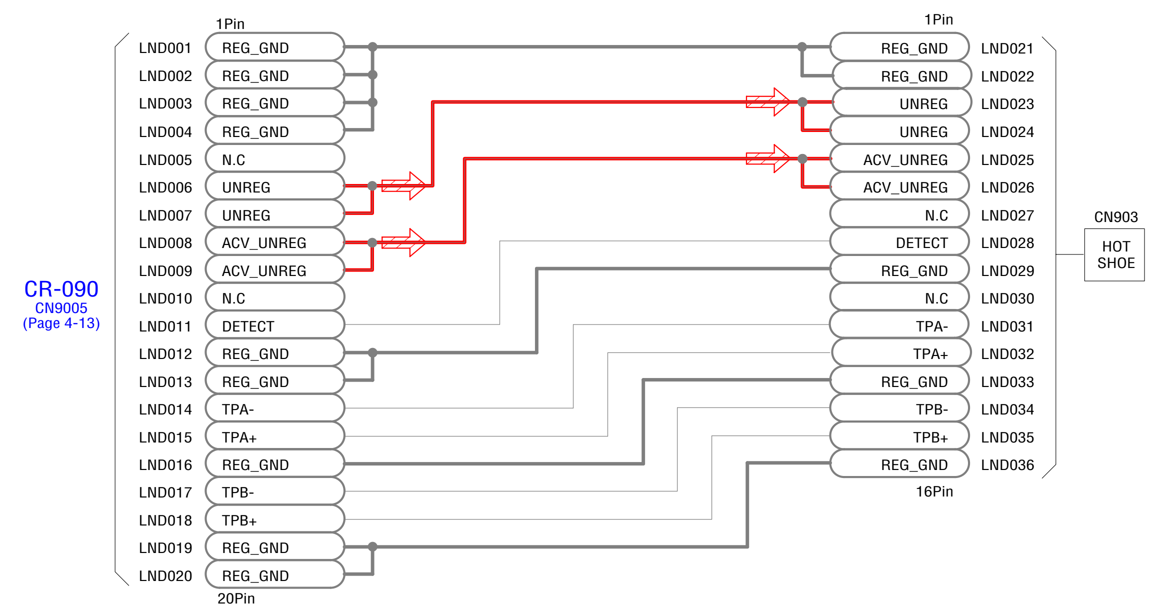


Note: CN902 (HOT SHOE) is not included in FP-202 flexible board.

FP-202 FLEXIBLE BOARD

HOT SHOE (MEMORY RECORDING UNIT)

(PRINTED WIRING BOARD is omitted)



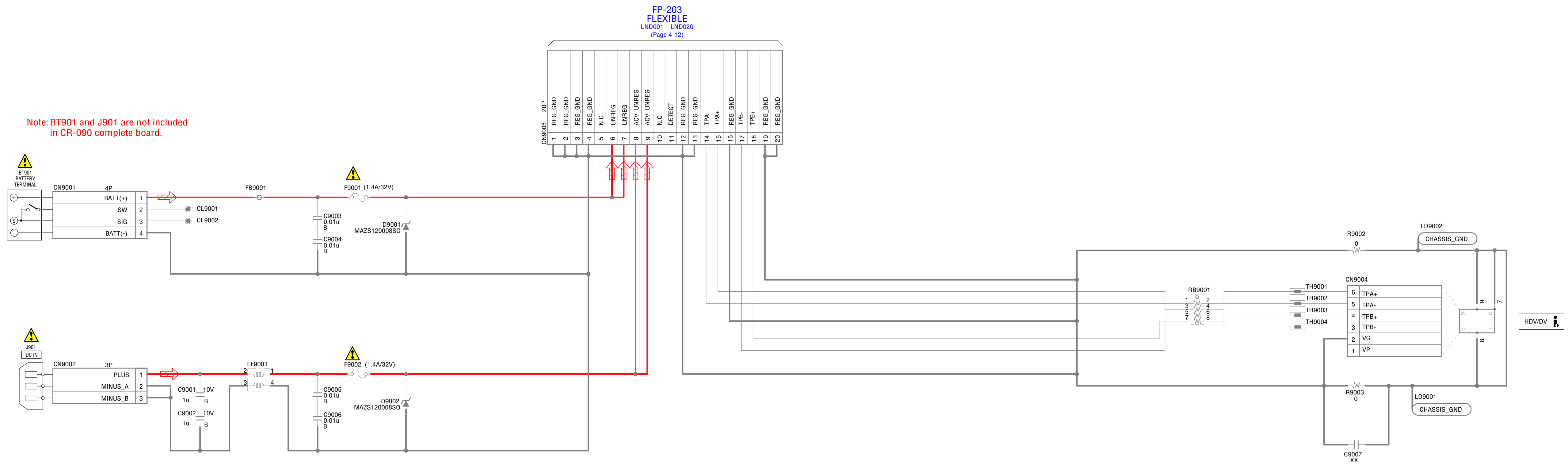
Note: CN903 (HOT SHOE) is not included in FP-203 flexible board.

FP-203 FLEXIBLE BOARD

HOT SHOE (i.LINK CRADLE)

(PRINTED WIRING BOARD is omitted)

• Refer to page 4-2 (English), 4-3 (Japanese) for mark ⚠.



CR-090 BOARD

DC IN, HDV/DV CONNECTOR

XX MARK:NO MOUNT

05

4-3. PRINTED WIRING BOARDS

Link

TK-071 BOARD	SW-525 BOARD
CF-110 BOARD	CR-090 BOARD
LC-095 BOARD	

COMMON NOTE FOR PRINTED WIRING BOARDS

4-3. PRINTED WIRING BOARDS

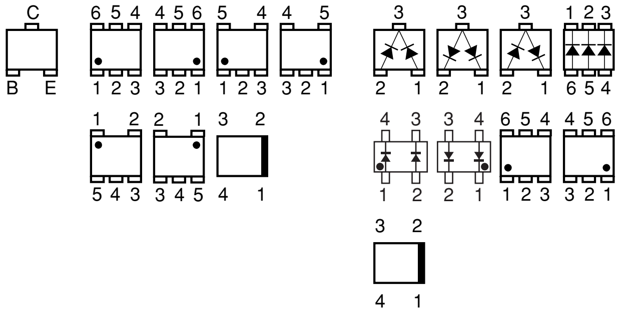
(ENGLISH)

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS

- : Uses unleaded solder.
- : Circuit board
  : Flexible board
  Pattern from the side which enables seeing.
  : pattern of the rear side
  (The other layers' patterns are not indicated)
- Through hole is omitted.
- There are a few cases that the part printed on diagram isn't mounted in this model.
- : panel designation

- Chip parts.

Transistor　　　　　　　　Diode



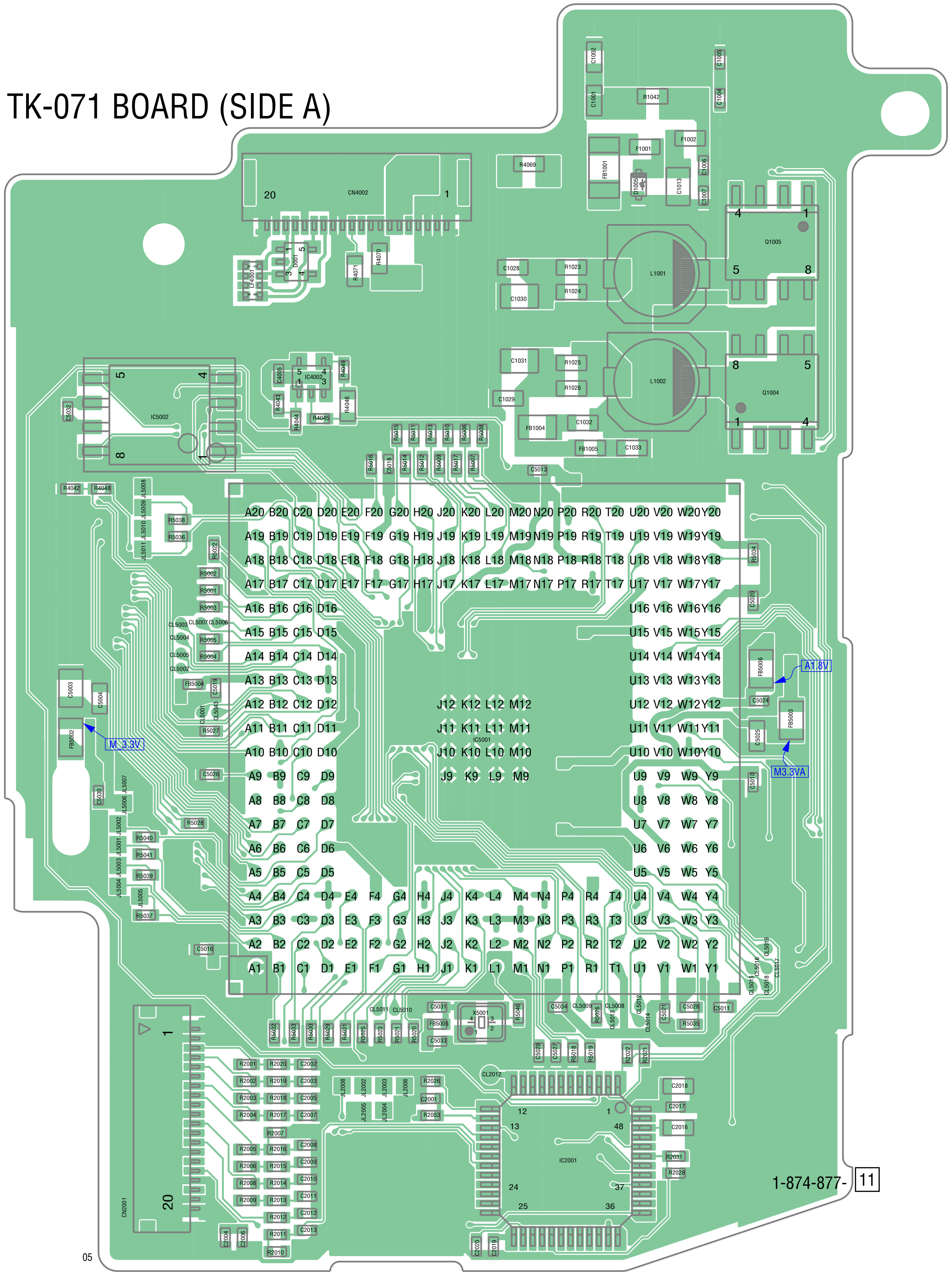
(JAPANESE)

プリント図共通ノート
【プリント図ノート】
・：無鉛半田を使用しています。
・：基板
　：フレキシブル配線板
　見ている面側のパターン。
　：裏側のパターン
　（他のパターンについては表示されていません）
・スルーホールは省略。
・プリント図には，本機で使用していない部品が記載されている場合があります。
・はパネル表示名称。

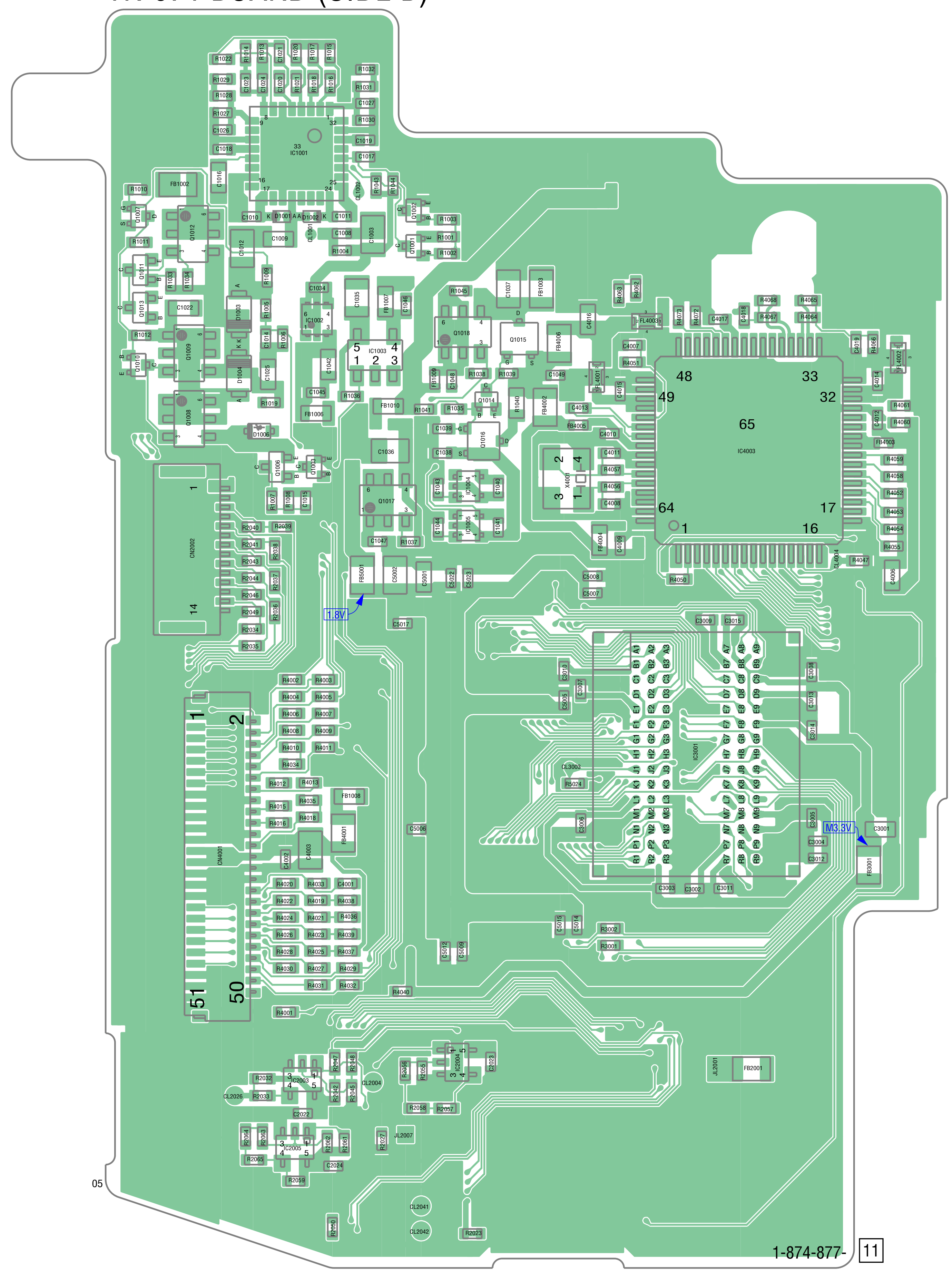
TK-071 (6 layers)

: Uses unleaded solder.

TK-071 BOARD (SIDE A)



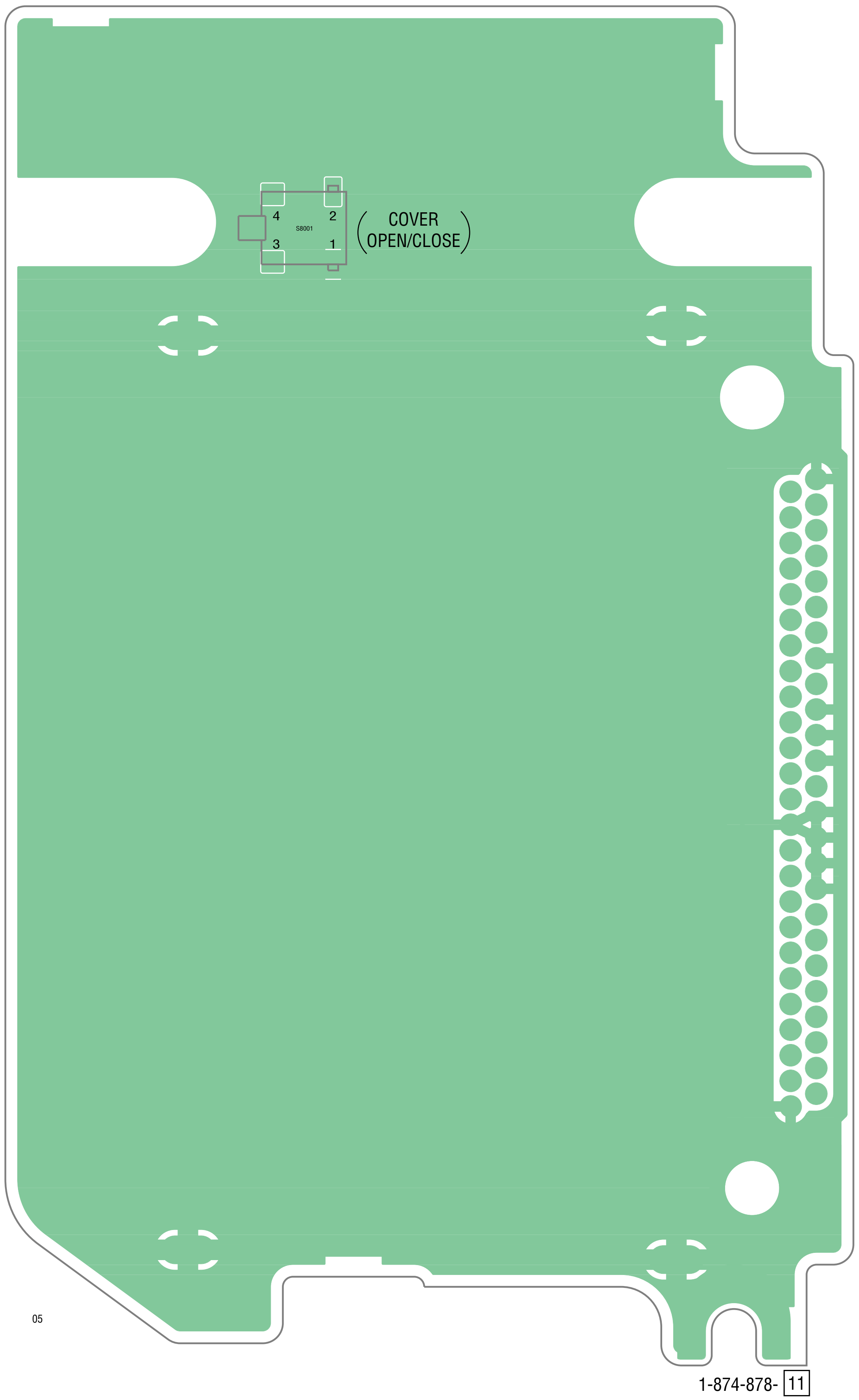
TK-071 BOARD (SIDE B)



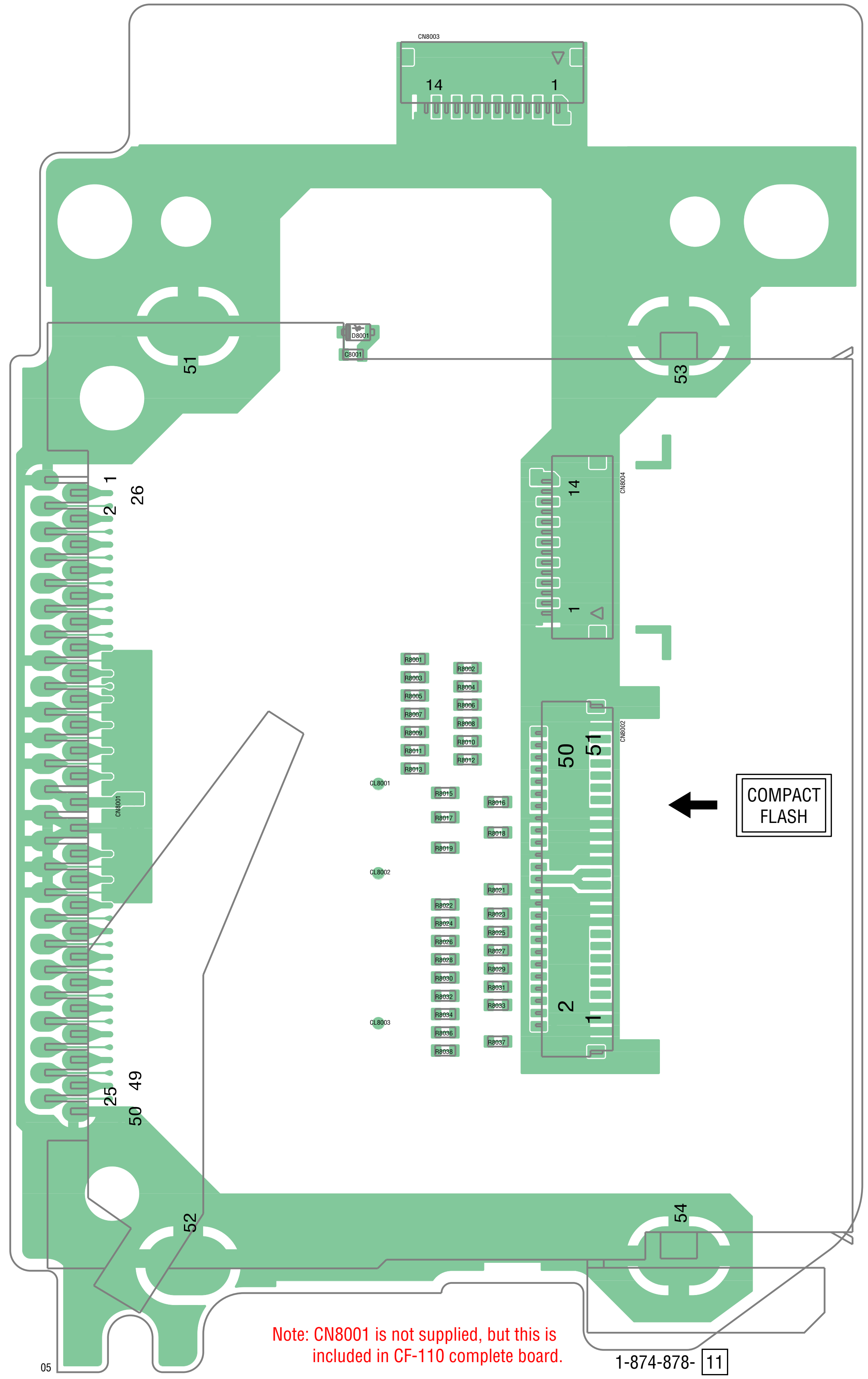
CF-110 (6 layers)

: Uses unleaded solder.

CF-110 BOARD (SIDE A)



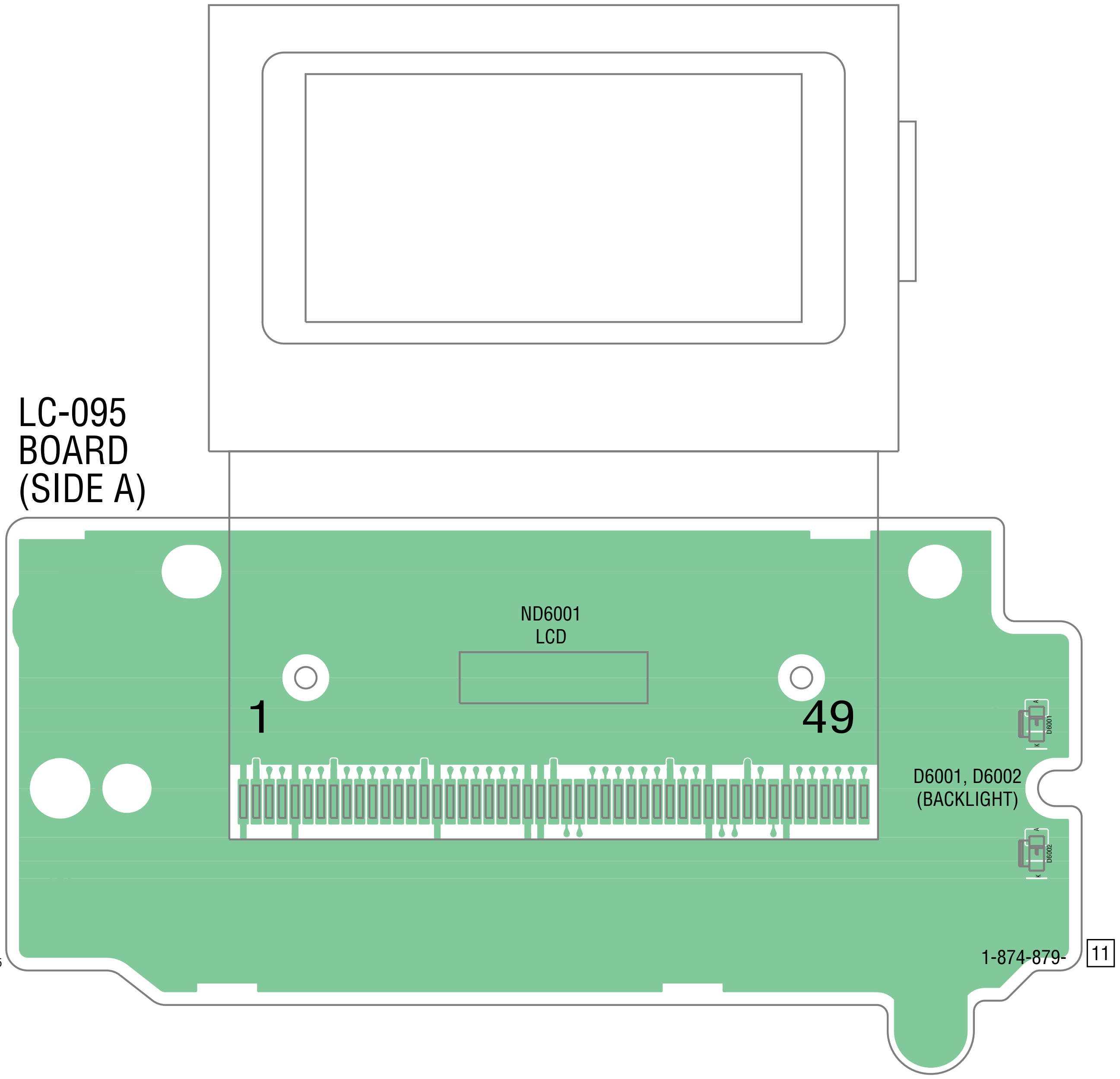
CF-110 BOARD (SIDE B)



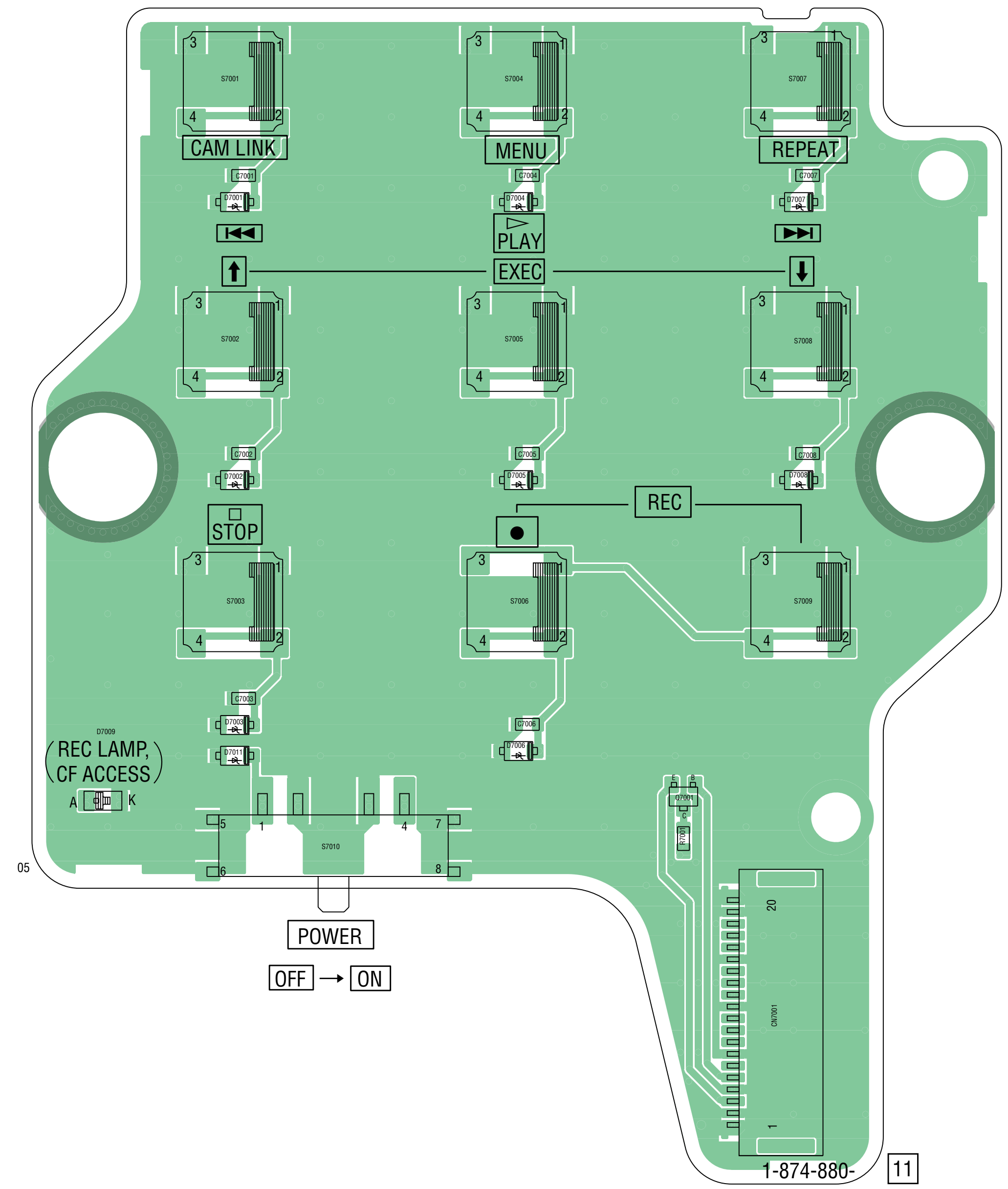
LC-095 (6 layers), SW-525 (6 layers)

: Uses unleaded solder.

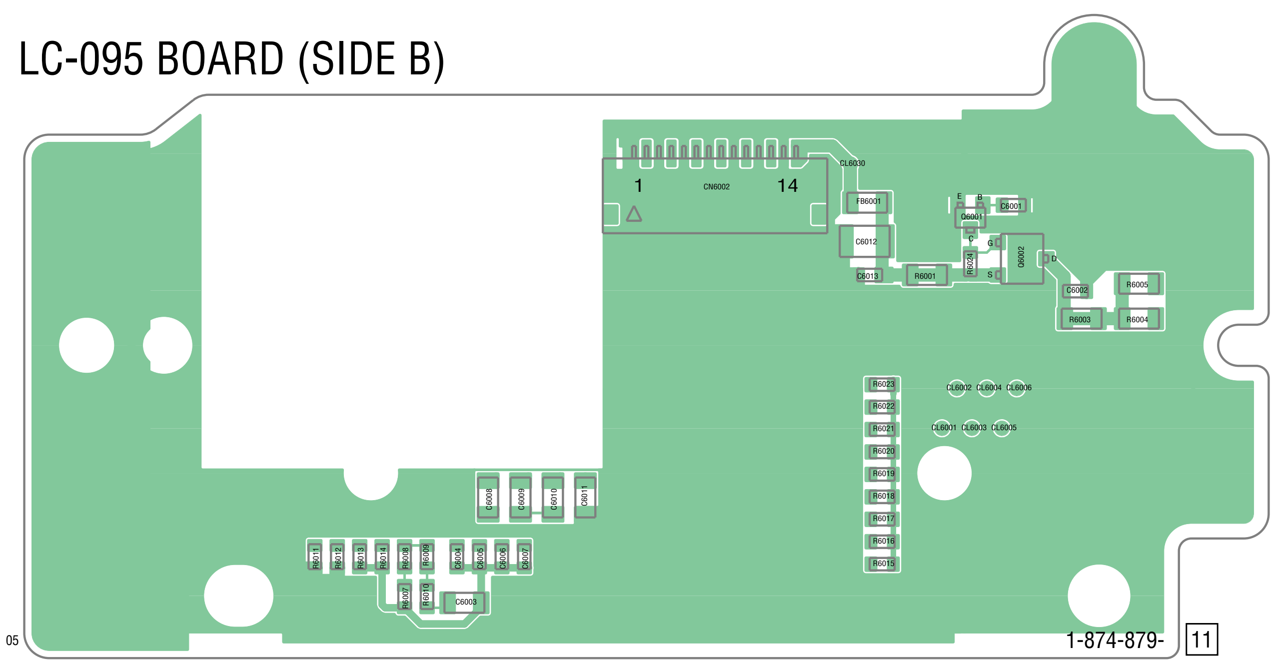
LC-095 BOARD (SIDE A)



SW-525 BOARD



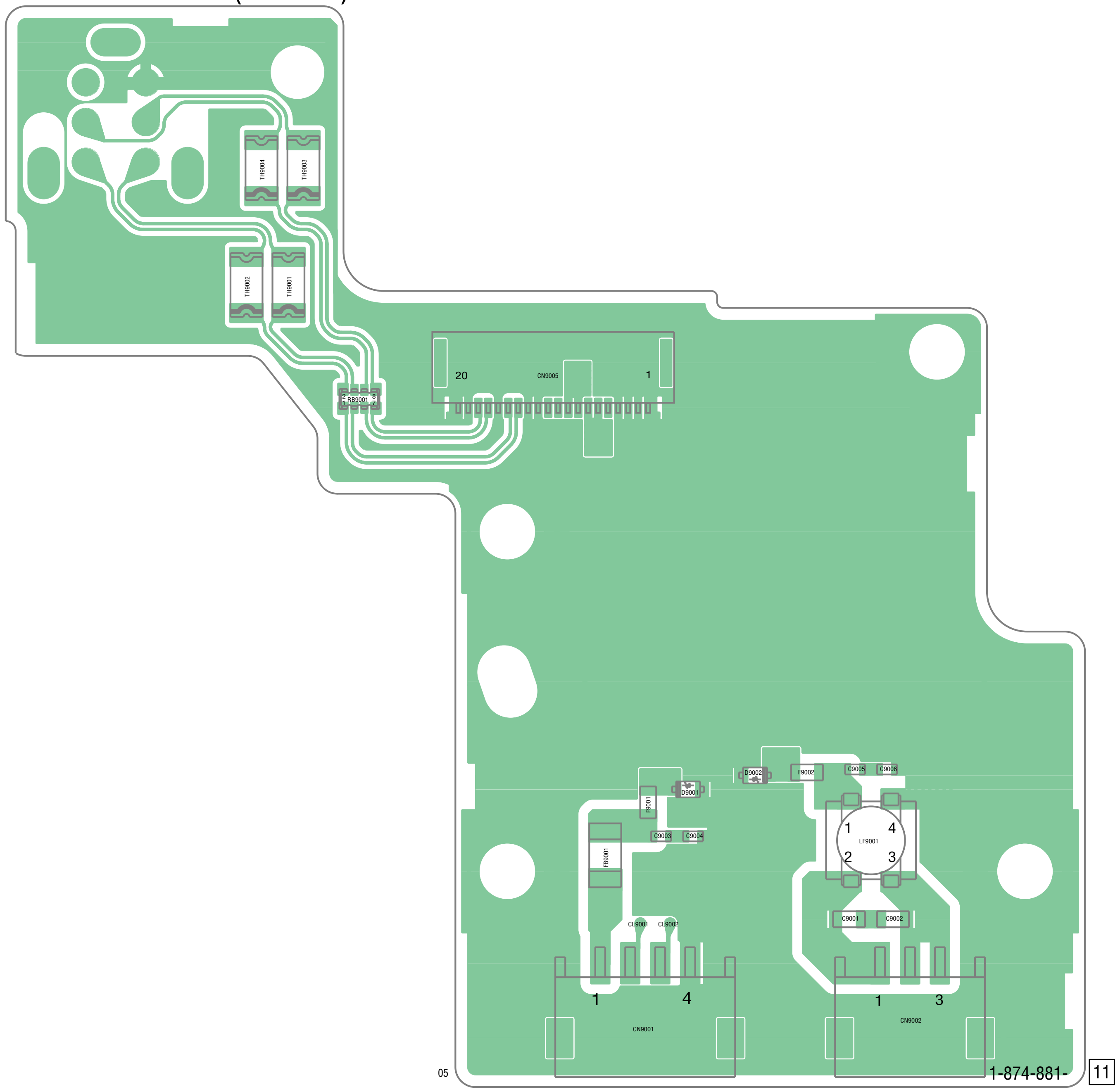
LC-095 BOARD (SIDE B)



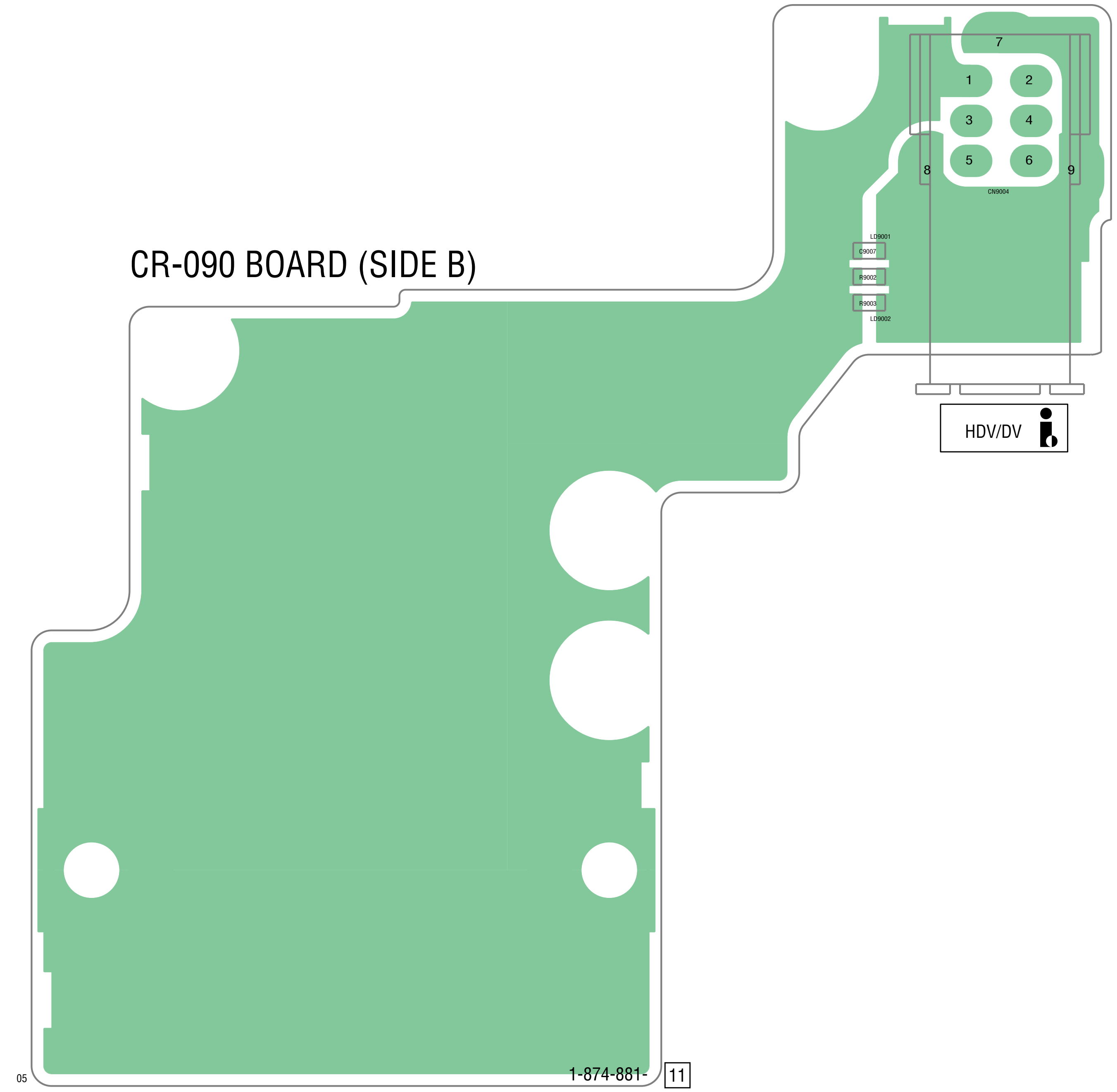
CR-090 (6 layers)

: Uses unleaded solder.

CR-090 BOARD (SIDE A)



CR-090 BOARD (SIDE B)



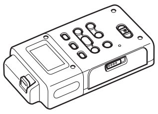
NOTE

5. REPAIR PARTS LIST

NOTE: Characters A to Z of the electrical parts list indicate location of exploded views in which the desired part is shown.

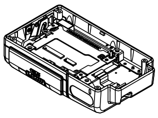
Link

EXPLODED VIEWS



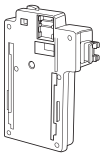
A

BASE CABINET SECTION



B

MAIN CABINET SECTION



C

ADAPTOR SECTION

Link

ELECTRICAL PARTS LIST

ACCESSORIES

CF-110 BOARD B	LC-095 BOARD B	TK-071 BOARD A
CR-090 BOARD C	SW-525 BOARD B	

5. REPAIR PARTS LIST

(ENGLISH)

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- CAPACITORS:
  uF: μF
- COILS
  uH: μH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Color Indication of Appearance Parts
  Example:
  (SILVER) : Cabinet's Color
  (Silver) : Parts Color

(JAPANESE)

【使用上の注意】
- ここに記載されている部品は, 補修用部品であるため, 回路図及びセットに付いている部品と異なる場合があります。
- -XX, -Xは標準化部品のため, セットに付いている部品と異なる場合があります。
- *印の部品は常備在庫しておりません。
- コンデンサの単位でuFはμFを示します。
- 抵抗の単位Ωは省略してあります。
  金　　被：金属被膜抵抗。
  サンキン：酸化金属被膜抵抗。
- インダクタの単位でuHはμHを示します。
- 半導体の名称でuA..., uPA..., uPB..., uPC..., uPD...等はそれぞれμA..., μPA..., μPB..., μPC..., μPD...を示します。

お願い
図面番号で部品を指定するときは基板名又はブロックを併せて指定してください。

⚠印の部品，または⚠印付の点線で囲まれた部品は，安全性を維持するために，重要な部品です。
従って交換時は, 必ず指定の部品を使用してください。

- 外装部品色表示
  例：
  (SILVER):セットの色を表す。
  (Silver)　: 部品の色を表す。

- Abbreviation
  AR : Argentine model
  AUS : Australian model
  BR : Brazilian model
  CH : Chinese model
  CND : Canadian model
  EE : East European model
  HK : Hong Kong model
  J : Japanese model
  JE : Tourist model
  KR : Korea model
  NE : North European model

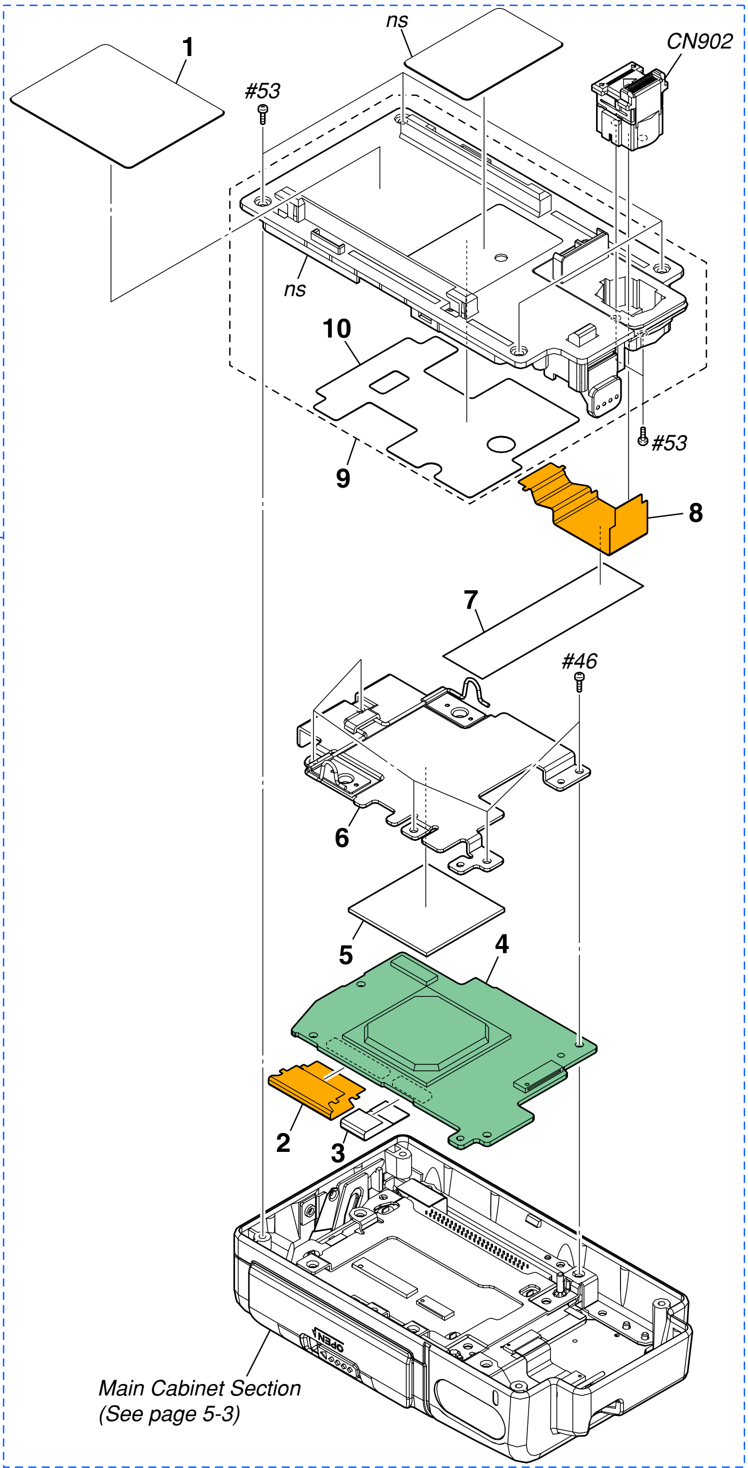
Ver. 1.2 2009.03
The changed portions from Ver. 1.1 are shown in blue.

DISASSEMBLY HARDWARE LIST

5-1. EXPLODED VIEWS

5-1-1. BASE CABINET SECTION

ns: not supplied



Note: There are differences in the label indication in each country/area.
Use the correct part for the each camera or model.
(See the chart below)

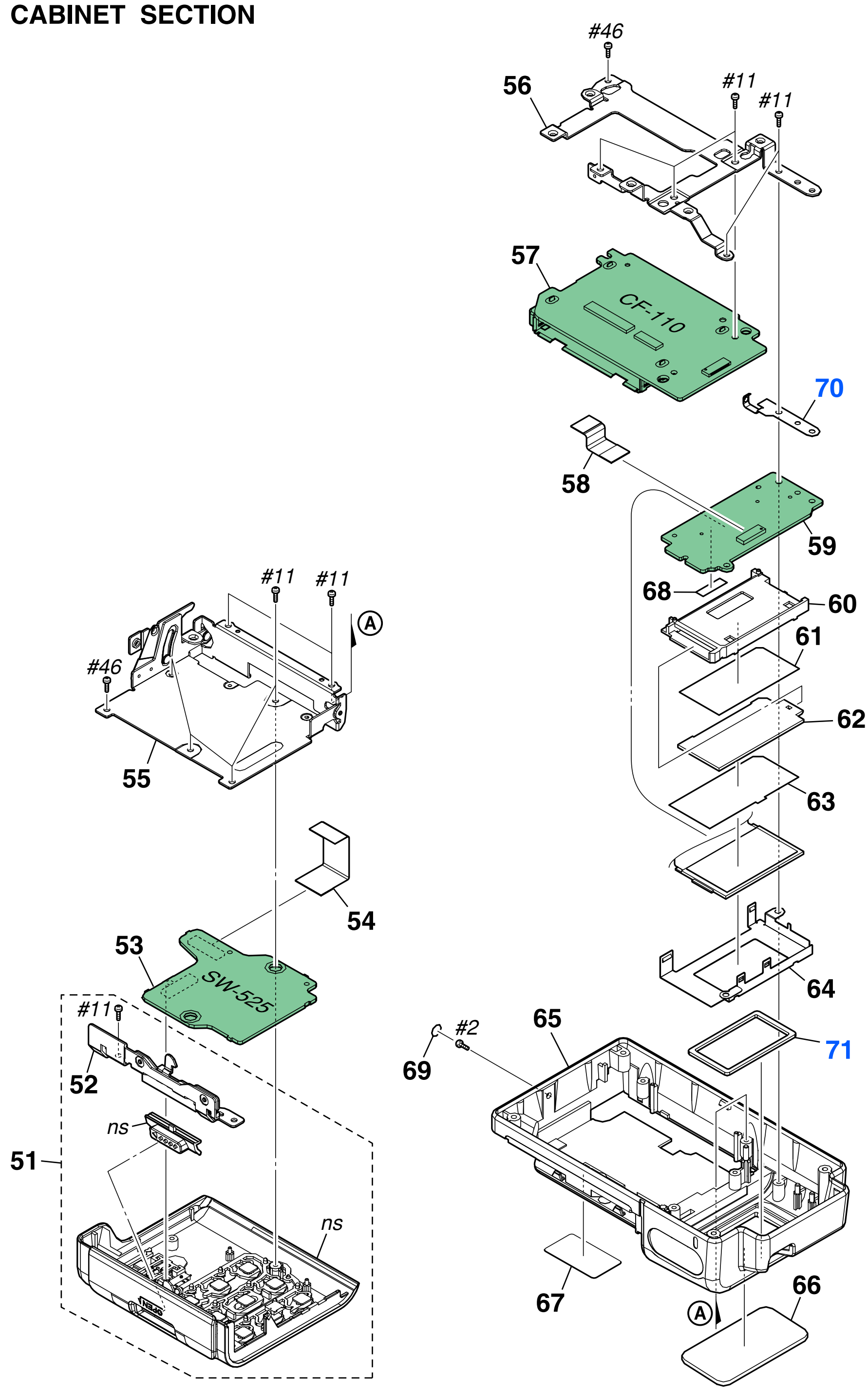
Note: 仕向によりラベル表示に相違があります。
下表を参照してカメラ本体の機種名・仕向に合った部品を使用してください。

Main Model	Part No. Description
HVR-Z7J HVR-S270J HVR-MRC1K (J)	* A-1700-861-A SERVICE (HVR-MRC1 MAIN J)
HVR-Z7U HVR-S270U HVR-MRC1K (US, CND)	* A-1700-862-A SERVICE (HVR-MRC1 MAIN U)
HVR-Z7N HVR-S270N	* A-1700-863-A SERVICE (HVR-MRC1 MAIN N)
HVR-Z7P HVR-S270P	* A-1700-864-A SERVICE (HVR-MRC1 MAIN EP)
HVR-Z7E HVR-S270E	
HVR-MRC1K (AEP)	* A-1700-865-A SERVICE (HVR-MRC1 MAIN KCE)
HVR-Z7C HVR-S270C HVR-MRC1K (CH)	* A-1700-866-A SERVICE (HVR-MRC1 MAIN C)

Ref. No.	Part No.	Description
* 1	3-295-565-01	LABEL (J), CF CAUTION (J)
* 1	3-295-566-01	LABEL (U), CF CAUTION (US, CND, AEP, E)
* 1	3-295-567-01	LABEL (CN), CF CAUTION (CH)
2	1-965-666-11	FP-201 FLEXIBLE BOARD
3	1-835-017-11	FLEXIBLE FLAT CABLE (FFC-159)
4	A-1498-040-A	TK-071 BOARD, COMPLETE (SERVICE)
5	3-290-970-01	SHEET, RADIATION
6	X-2188-921-1	HEAT SINK ASSY, CF
* 7	3-290-971-01	SHEET (FP202)
8	1-965-667-11	FP-202 FLEXIBLE BOARD
9	X-2188-922-1	CABINET ASSY, CF BASE
* 10	3-290-945-01	LABEL, FUSE REPLACEMENT
* 11	(Note)	SERVICE (HVR-MRC1 MAIN)
CN902	1-818-891-31	CONNECTOR, EXTERNAL (HOT SHOE)
#46	2-660-401-11	SCREW (M1.7), NEW TRU-STAR, P2 (Red)
#53	3-080-206-21	SCREW, TAPPING, P2 (Black)

5-1-2. MAIN CABINET SECTION

ns: not supplied



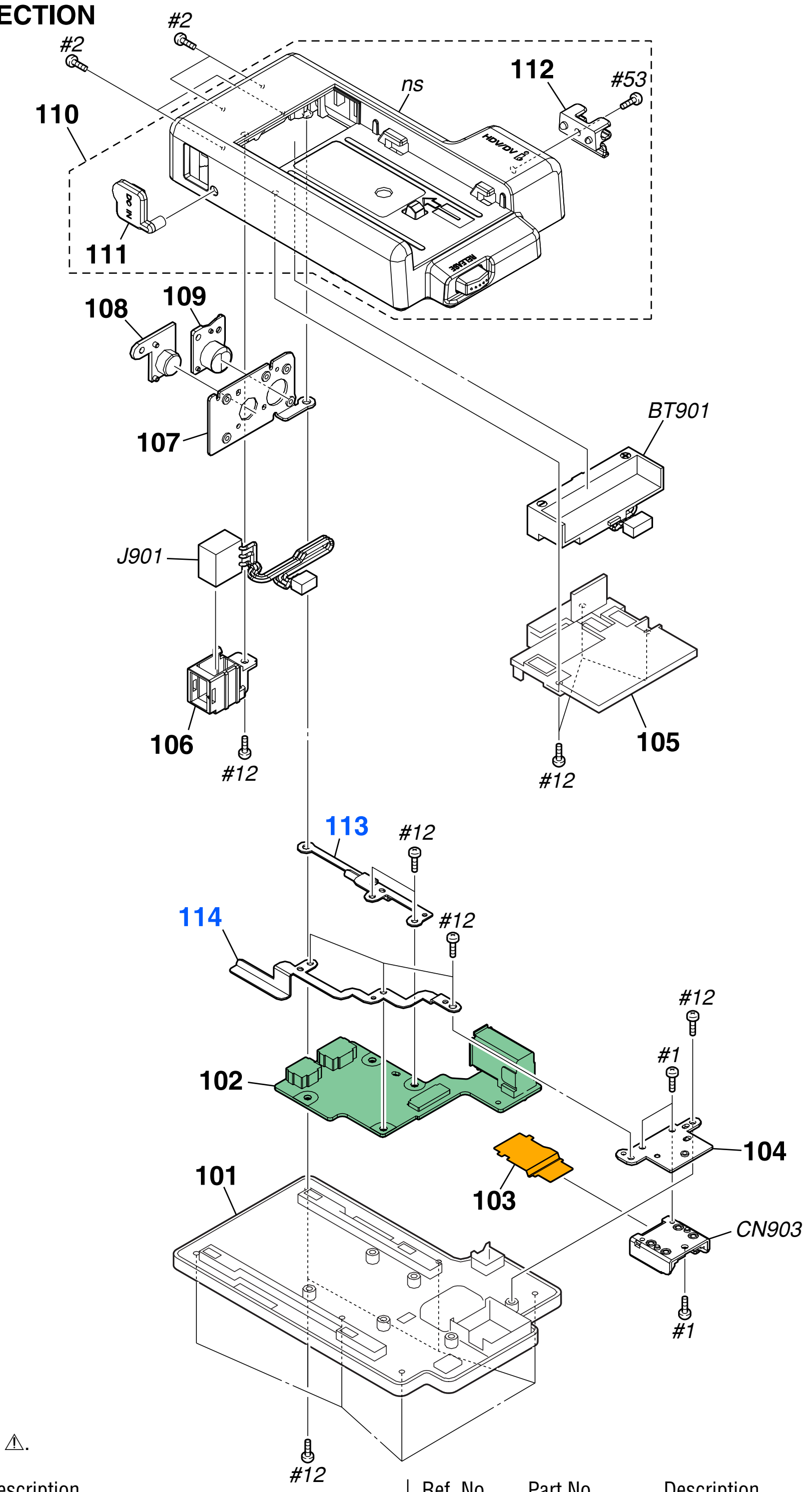
Ref. No.	Part No.	Description
51	X-2188-920-1	DOOR ASSY, CF
52	X-2188-919-1	LOCK ASSY, DOOR
53	A-1490-529-A	SW-525 BOARD, COMPLETE
54	1-835-016-11	FLEXIBLE FLAT CABLE (FFC-157)
55	X-2188-918-1	FRAME ASSY, DOOR
56	X-2188-823-1	FRAME ASSY, CF MAIN
57	A-1490-526-A	CF-110 BOARD, COMPLETE
58	1-835-017-11	FLEXIBLE FLAT CABLE (FFC-159)
59	A-1544-473-A	LC-095 BOARD, COMPLETE (SERVICE)
60	3-290-930-01	HOLDER, LCD
* 61	3-290-929-01	SHEET, CF REFLECTION
* 62	3-290-927-01	LIGHT, GUIDE
* 63	3-290-928-01	SHEET, CF DIFFUSION
* 64	3-290-926-01	FRAME, CF LCD GROUND
65	3-288-253-01	CABINET, CF MAIN
66	3-290-968-01	WINDOW, LCD
67	3-295-564-01	LABEL, CF
* 68	2-891-483-01	TAPE, LCD
69	3-296-530-01	SHEET (H)
* 70	3-290-969-01	FRAME (UPPER), CF DOOR GROUND
* 71	2-697-881-01	DAMPER, LCD
#2	2-635-562-31	SCREW (M1.7) (Black)
#11	3-078-890-11	SCREW, TAPPING (Silver)
#46	2-660-401-11	SCREW (M1.7), NEW TRU-STAR, P2 (Red)

Ver. 1.2 2009.03
The changed portions from
Ver. 1.1 are shown in blue.

DISASSEMBLY HARDWARE LIST

5-1-3. ADAPTOR SECTION

ns: not supplied



• Refer to page 5-1 for mark ⚠.

Ref. No.	Part No.	Description
101	3-288-257-01	CABINET (CF)
102	A-1490-527-A	CR-090 BOARD, COMPLETE
103	1-965-668-11	FP-203 FLEXIBLE BOARD
* 104	3-290-984-01	PLATE, SHOE RETAINER
* 105	3-290-981-01	RETAINER, TERMINAL
106	3-290-980-01	HOLDER, DC-IN
* 107	3-290-985-01	PLATE, TRIPOD RETAINER
108	3-290-986-01	GUIDE, TRIPOD
109	2-664-982-01	SCREW, TRIPOD
110	X-2188-923-1	CABINET (BATT) ASSY
111	2-697-897-01	COVER, DC-IN
112	2-890-916-01	CLAMP, CABLE
* 113	3-290-982-01	PLATE (L), GROUND
* 114	3-290-983-01	PLATE (R), GROUND
⚠BT901	1-694-411-31	TERMINAL BOARD, BATTERY
CN903	1-818-890-21	CONNECTOR, EXTERNAL (HOT SHOE)
⚠J901	1-785-247-31	CONNECTOR, DC-IN
#1	2-635-562-11	SCREW (M1.7) (Black)
#2	2-635-562-31	SCREW (M1.7) (Black)
#12	3-080-204-21	SCREW, TAPPING, P2 (Black)
#53	3-080-206-21	SCREW, TAPPING, P2 (Black)

5-2. ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description			
	A-1490-526-A	CF-110 BOARD, COMPLETE			
		**********************			
		(CN8001 is not supplied, but this is included in CF-110 complete board.)			
		< CAPACITOR >			
C8001	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN8001	(Not supplied)	CONNECTOR, CF CARD			
* CN8002	1-820-857-81	CONNECTOR, FPC (ZIF) 51P			
* CN8003	1-820-336-71	CONNECTOR, FFC/FPC (ZIF) 14P			
* CN8004	1-820-336-71	CONNECTOR, FFC/FPC (ZIF) 14P			
		< DIODE >			
D8001	8-719-074-67	DIODE EDZ-TE61-5.6B			
		< SWITCH >			
S8001	1-786-148-11	SWITCH, PUSH (1 KEY) (COVER OPEN/CLOSE)			

Ref. No.	Part No.	Description			
	A-1490-527-A	CR-090 BOARD, COMPLETE			
		**********************			
		< CAPACITOR >			
C9001	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C9002	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C9003	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C9004	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C9005	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C9006	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN9001	1-580-057-11	PIN, CONNECTOR (SMD) 4P			
CN9002	1-580-056-21	PIN, CONNECTOR (SMD) 3P			
CN9004	1-817-382-11	CONNECTOR, I-LINK (6P) (HDV/DV)			
CN9005	1-816-648-61	FFC/FPC CONNECTOR (LIF) 20P			
		< DIODE >			
* D9001	6-501-961-01	DIODE MAZS120G08S0			
* D9002	6-501-961-01	DIODE MAZS120G08S0			
		< FUSE >			
⚠F9001	1-576-406-11	FUSE, MICRO (1608) (1.4A/32V)			
⚠F9002	1-576-406-11	FUSE, MICRO (1608) (1.4A/32V)			
		< FERRITE BEAD >			
* FB9001	1-481-196-21	FERRITE, EMI (SMD) (3216)			
		< LINE FILTER >			
* LF9001	1-457-217-21	COMMON MODE CHOKE COIL			
		< RESISTOR >			
R9002	1-216-864-11	SHORT CHIP	0		
R9003	1-216-864-11	SHORT CHIP	0		
		< COMPOSITION CIRCUIT BLOCK >			
RB9001	1-234-400-21	CONDUCTOR, NETWORK (1005X4)			
		< THERMISTOR >			
TH9001	1-805-726-11	THERMISTOR, POSITIVE			
TH9002	1-805-726-11	THERMISTOR, POSITIVE			
TH9003	1-805-726-11	THERMISTOR, POSITIVE			
TH9004	1-805-726-11	THERMISTOR, POSITIVE			

Ref. No.	Part No.	Description			
	A-1544-473-A	LC-095 BOARD, COMPLETE (SERVICE)			
		**********************			
		< CAPACITOR >			
C6001	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6002	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C6003	1-100-352-91	CERAMIC CHIP	1uF	20%	16V
C6004	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6007	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C6008	1-100-352-91	CERAMIC CHIP	1uF	20%	16V
C6009	1-100-352-91	CERAMIC CHIP	1uF	20%	16V
C6010	1-100-352-91	CERAMIC CHIP	1uF	20%	16V
C6011	1-100-352-91	CERAMIC CHIP	1uF	20%	16V
C6012	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C6013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
		< CONNECTOR >			
* CN6002	1-820-336-71	CONNECTOR, FFC/FPC (ZIF) 14P			
		< DIODE >			
* D6001	6-501-573-01	DIODE CL-271TLY-C-TS (BACKLIGHT)			
* D6002	6-501-573-01	DIODE CL-271TLY-C-TS (BACKLIGHT)			
		< FERRITE BEAD >			
FB6001	1-400-794-21	EMI FERRITE (SMD) (1608)			
		< LIQUID CRYSTAL DISPLAY >			
ND6001	1-805-549-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q6001	6-550-119-01	TRANSISTOR	DTC144EMFS6T2L		
Q6002	6-551-067-01	TRANSISTOR	RTF015P02TL		
		< RESISTOR >			
R6004	1-218-839-11	METAL CHIP	470	0.5%	1/10W
R6005	1-218-839-11	METAL CHIP	470	0.5%	1/10W
R6007	1-208-946-81	METAL CHIP	300K	0.5%	1/16W
R6008	1-218-948-11	RES-CHIP	390	5%	1/16W
R6009	1-208-939-11	METAL CHIP	150K	0.5%	1/16W
R6010	1-208-952-81	METAL CHIP	510K	0.5%	1/16W
R6011	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6012	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6013	1-218-971-11	RES-CHIP	33K	5%	1/16W

• Refer to page 5-1 for mark ⚠.

Ver. 1.1 2008.06

The changed portions from
Ver. 1.0 are shown in blue.

Ref. No.	Part No.	Description			
R6014	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6015	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6016	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6017	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6018	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6019	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6020	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6021	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6022	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6023	1-218-971-11	RES-CHIP	33K	5%	1/16W
R6024	1-208-923-11	METAL CHIP	33K	0.5%	1/16W

A-1490-529-A SW-525 BOARD, COMPLETE
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< CAPACITOR >

Ref. No.	Part No.	Description			
C7001	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7002	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7003	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7004	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7005	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7006	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7007	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C7008	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V

< CONNECTOR >

Ref. No.	Part No.	Description
CN7001	1-816-648-61	FFC/FPC CONNECTOR (LIF) 20P

< DIODE >

Ref. No.	Part No.	Description	
D7001	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7002	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7003	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7004	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7005	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7006	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7007	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7008	8-719-074-67	DIODE	EDZ-TE61-5.6B
D7009	8-719-077-09	DIODE	CL-196HR-CD-T (REC LAMP, CF ACCESS)

< TRANSISTOR >

Ref. No.	Part No.	Description	
Q7001	6-550-239-01	TRANSISTOR	DTA144EMFS6T2L

< RESISTOR >

Ref. No.	Part No.	Description			
R7001	1-208-671-11	METAL CHIP	330	0.5%	1/16W

< SWITCH >

Ref. No.	Part No.	Description
S7001	1-771-844-21	SWITCH, TACTILE (CAM LINK)
S7002	1-771-844-21	SWITCH, TACTILE (|◀◀, EXEC ⬆)
S7003	1-771-844-21	SWITCH, TACTILE (□ STOP)
S7004	1-771-844-21	SWITCH, TACTILE (MENU)
S7005	1-771-844-21	SWITCH, TACTILE (▷ PLAY, EXEC)
S7006	1-771-844-21	SWITCH, TACTILE (REC ●)
S7007	1-771-844-21	SWITCH, TACTILE (REPEAT)
S7008	1-771-844-21	SWITCH, TACTILE (▶▶|, EXEC ⬇)
S7009	1-771-844-21	SWITCH, TACTILE (REC)
S7010	1-771-731-21	SWITCH, SLIDE (POWER (ON/OFF))

A-1498-040-A TK-071 BOARD, COMPLETE (SERVICE)
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(IC5002 is not supplied, but this is included in TK-071 complete board.)

< CAPACITOR >

Ref. No.	Part No.	Description			
C1001	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1002	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1003	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C1004	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C1005	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C1006	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C1007	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C1008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1009	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1012	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C1013	1-100-966-91	CERAMIC CHIP	10uF	20%	10V
C1014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1016	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1017	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
* C1018	1-112-692-11	CERAMIC CHIP	1000PF	5%	50V
* C1019	1-112-692-11	CERAMIC CHIP	1000PF	5%	50V
C1020	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C1021	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C1022	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1023	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C1024	1-164-874-11	CERAMIC CHIP	100PF	5%	50V
C1025	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1026	1-164-860-11	CERAMIC CHIP	27PF	5%	50V
C1027	1-164-860-11	CERAMIC CHIP	27PF	5%	50V
* C1028	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
* C1029	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1030	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C1031	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
* C1032	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
* C1033	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
C1034	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1035	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C1036	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C1037	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C1038	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1039	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1040	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C1041	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C1042	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1043	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
C1044	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1045	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1046	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C1047	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C1048	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C1049	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
C2001	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V

Ver. 1.2 2009.03

The changed portions from
Ver. 1.1 are shown in blue.

TK-071

	Ref. No.	Part No.	Description			
	C2002	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2003	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2004	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C2005	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C2007	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2008	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2009	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2010	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2011	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2012	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2013	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C2016	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
	C2017	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
*	C2018	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C2022	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C2023	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
*	C3001	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C3002	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3003	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3004	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3007	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C3015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4001	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C4002	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4003	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
	C4005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
*	C4006	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C4007	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C4008	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
	C4009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4011	1-164-852-11	CERAMIC CHIP	12PF	5%	50V
	C4012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
*	C4016	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C4017	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C4018	1-112-717-91	CERAMIC CHIP	1uF	10%	6.3V
	C4019	1-164-933-11	CERAMIC CHIP	220PF	10%	50V
*	C5001	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C5002	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
	C5003	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
*	C5004	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C5005	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5006	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5007	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

	Ref. No.	Part No.	Description			
	C5008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5016	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5017	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5018	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5019	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5020	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
	C5021	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5022	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5023	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5024	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
*	C5025	1-112-746-11	CERAMIC CHIP	4.7uF	10%	6.3V
	C5026	1-164-933-11	CERAMIC CHIP	220PF	10%	50V
	C5028	1-100-567-81	CERAMIC CHIP	0.01uF	10%	25V
	C5030	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5031	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5032	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
	C5033	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
	C5034	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
			< CONNECTOR >			
*	CN2001	1-818-516-71	CONNECTOR, FFC/FPC (ZIF) 20P			
	CN2002	1-816-645-61	FFC/FPC CONNECTOR (LIF) 14P			
*	CN4001	1-820-857-81	CONNECTOR, FPC (ZIF) 51P			
	CN4002	1-816-648-61	FFC/FPC CONNECTOR (LIF) 20P			
			< DIODE >			
	D001	6-500-750-01	DIODE NSAD500H-T1-A			
⚠	D1001	6-501-272-01	DIODE RB520CS-30T2R			
⚠	D1002	6-501-272-01	DIODE RB520CS-30T2R			
	D1003	6-501-124-01	DIODE RSX101VA-30TR			
	D1004	6-501-124-01	DIODE RSX101VA-30TR			
*	D1005	6-501-961-01	DIODE MAZS120G08S0			
*	D1006	6-501-961-01	DIODE MAZS120G08S0			
			< FUSE >			
⚠	F1001	1-576-406-11	FUSE, MICRO (1608) (1.4A/32V)			
⚠	F1002	1-576-406-11	FUSE, MICRO (1608) (1.4A/32V)			
			< FERRITE BEAD >			
*	FB1001	1-481-196-21	FERRITE, EMI (SMD) (3216)			
	FB1002	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
	FB1003	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
	FB1004	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
	FB1005	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
	FB1006	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
	FB1007	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
	FB1008	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
	FB1009	1-400-331-11	FERRITE, EMI (SMD) (1005)			
	FB1010	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
	FB2001	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			

• Refer to page 5-1 for mark ⚠.

Ref. No.	Part No.	Description			
FB3001	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB4001	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB4002	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB4003	1-400-331-11	FERRITE, EMI (SMD) (1005)			
FB4004	1-400-619-11	BEAD, FERRITE (CHIP) (1608)			
FB4005	1-400-331-11	FERRITE, EMI (SMD) (1005)			
FB4006	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB5001	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB5002	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB5003	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
FB5004	1-400-331-11	FERRITE, EMI (SMD) (1005)			
FB5005	1-400-331-11	FERRITE, EMI (SMD) (1005)			
FB5006	1-400-915-21	INDUCTOR (EMI FERRITE) (2012)			
		< FILTER >			
FL4001	1-234-939-21	FILTER, EMI REMOVAL (SMD)			
FL4002	1-234-939-21	FILTER, EMI REMOVAL (SMD)			
FL4003	1-234-939-21	FILTER, EMI REMOVAL (SMD)			
		< IC >			
⚠IC1001	6-707-357-01	IC	LTC3728LXCUH#TR-R5		
* IC1002	6-709-667-01	IC	S-812C33BPI-C4NTFG		
IC1003	6-704-257-01	IC	TK11130CSCL-G		
* IC1004	6-710-663-01	IC	BU4325FVE-TR		
* IC1005	6-710-663-01	IC	BU4325FVE-TR		
* IC2001	6-712-221-01	IC	uPD78F0513GA (S)-8EU-E2-A		
IC2003	8-759-058-64	IC	TC7S32FU (TE85R)		
IC2004	8-759-058-64	IC	TC7S32FU (TE85R)		
* IC3001	6-710-662-01	IC	K4M513233C-DN75T		
IC4002	8-759-058-62	IC	TC7S08FU (TE85R)		
* IC4003	6-710-683-01	IC	TSB41AB2PAPR		
* IC5001	6-712-220-01	IC	IND60C32A		
IC5002	(Not supplied)	IC	AT45DB081B-CNU (Note)		
IC5002	(Not supplied)	IC	AT45DB081D-SU (Note)		
		< COIL >			
L1001	1-456-019-11	INDUCTOR	4.7uH		
L1002	1-456-019-11	INDUCTOR	4.7uH		
		< LINE FILTER >			
LF4001	1-457-064-13	COMMON MODE CHOKE COIL			
		< TRANSISTOR >			
Q1001	6-550-566-01	TRANSISTOR	DTC115TMFS6T2L		
Q1002	6-550-566-01	TRANSISTOR	DTC115TMFS6T2L		
Q1003	6-550-119-01	TRANSISTOR	DTC144EMFS6T2L		
⚠Q1004	6-709-438-01	TRANSISTOR	FDS6986AS		
⚠Q1005	6-709-438-01	TRANSISTOR	FDS6986AS		
Q1006	8-729-928-34	TRANSISTOR	DTA124EE-TL		
Q1007	6-551-346-01	TRANSISTOR	LSK3541FS8T2L		
Q1008	6-550-354-01	TRANSISTOR	RTQ035P02TR		
Q1009	6-550-354-01	TRANSISTOR	RTQ035P02TR		
Q1010	6-550-566-01	TRANSISTOR	DTC115TMFS6T2L		
* Q1011	6-551-600-01	TRANSISTOR	DTC115EETL		
Q1012	6-550-354-01	TRANSISTOR	RTQ035P02TR		
* Q1013	6-551-600-01	TRANSISTOR	DTC115EETL		
Q1014	6-550-119-01	TRANSISTOR	DTC144EMFS6T2L		
Q1015	6-551-067-01	TRANSISTOR	RTF015P02TL		
Q1016	6-551-067-01	TRANSISTOR	RTF015P02TL		
Q1017	6-550-354-01	TRANSISTOR	RTQ035P02TR		
Q1018	6-550-354-01	TRANSISTOR	RTQ035P02TR		
		< RESISTOR >			
R1001	1-218-981-91	RES-CHIP	220K	5%	1/16W
R1002	1-218-974-11	RES-CHIP	56K	5%	1/16W
R1003	1-218-974-11	RES-CHIP	56K	5%	1/16W
R1004	1-208-635-11	METAL CHIP	10	0.5%	1/16W
R1005	1-218-974-11	RES-CHIP	56K	5%	1/16W
R1006	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R1007	1-218-978-11	RES-CHIP	120K	5%	1/16W
R1008	1-208-928-11	METAL CHIP	51K	0.5%	1/16W
R1009	1-208-696-11	METAL CHIP	3.6K	0.5%	1/16W
R1010	1-208-893-11	METAL CHIP	1.8K	0.5%	1/16W
R1012	1-218-982-11	RES-CHIP	270K	5%	1/16W
R1013	1-208-905-11	METAL CHIP	5.6K	0.5%	1/16W
R1014	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R1015	1-218-990-81	SHORT CHIP	0		
R1019	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1021	1-218-990-81	SHORT CHIP	0		
* R1023	1-245-685-21	RES-CHIP	0.051	5%	1/8W
* R1024	1-245-685-21	RES-CHIP	0.051	5%	1/8W
* R1025	1-245-685-21	RES-CHIP	0.051	5%	1/8W
* R1026	1-245-685-21	RES-CHIP	0.051	5%	1/8W
R1027	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R1028	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R1029	1-208-884-81	METAL CHIP	750	0.5%	1/16W
R1030	1-208-918-11	METAL CHIP	20K	0.5%	1/16W
R1031	1-208-712-11	METAL CHIP	16K	0.5%	1/16W
R1032	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R1033	1-218-982-11	RES-CHIP	270K	5%	1/16W
R1034	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1035	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R1036	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R1037	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R1038	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R1039	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R1040	1-216-789-11	METAL CHIP	2.2	5%	1/10W
R1041	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R1042	1-216-864-11	SHORT CHIP	0		
R1043	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1044	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1045	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2001	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2002	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2003	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2004	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2005	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2006	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2007	1-208-943-11	METAL CHIP	220K	0.5%	1/16W

• Refer to page 5-1 for mark ⚠.

Note: Two interchangeable kinds of IC are used for IC5002. It is included in TK-071 complete board though neither of these are supplied.

Note: IC5002には互換性のある2種類のICが使用されています。これらはいずれも供給されませんが，マウント済みTK-071基板に含まれます。

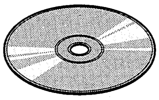
Ref. No.	Part No.	Description			
R2008	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2009	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2010	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2011	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2012	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2013	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2014	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2015	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2016	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2017	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2018	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2019	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2020	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2021	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2022	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2026	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R2027	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R2028	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R2032	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2033	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R2034	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2035	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2036	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2037	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2038	1-208-695-11	METAL CHIP	3.3K	0.5%	1/16W
R2040	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2041	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2042	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2043	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2044	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2045	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R2046	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2048	1-218-990-81	SHORT CHIP	0		
R2049	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2053	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R2055	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R2064	1-218-990-81	SHORT CHIP	0		
R3001	1-208-647-11	METAL CHIP	33	0.5%	1/16W
R3002	1-208-647-11	METAL CHIP	33	0.5%	1/16W
R4001	1-218-935-11	RES-CHIP	33	5%	1/16W
R4002	1-218-935-11	RES-CHIP	33	5%	1/16W
R4003	1-218-935-11	RES-CHIP	33	5%	1/16W
R4004	1-218-935-11	RES-CHIP	33	5%	1/16W
R4005	1-218-935-11	RES-CHIP	33	5%	1/16W
R4006	1-218-935-11	RES-CHIP	33	5%	1/16W
R4007	1-218-935-11	RES-CHIP	33	5%	1/16W
R4008	1-218-935-11	RES-CHIP	33	5%	1/16W
R4009	1-218-935-11	RES-CHIP	33	5%	1/16W
R4010	1-218-935-11	RES-CHIP	33	5%	1/16W
R4011	1-218-935-11	RES-CHIP	33	5%	1/16W
R4012	1-218-935-11	RES-CHIP	33	5%	1/16W
R4013	1-218-935-11	RES-CHIP	33	5%	1/16W
R4015	1-218-933-11	RES-CHIP	22	5%	1/16W
R4016	1-218-933-11	RES-CHIP	22	5%	1/16W
R4018	1-208-861-81	METAL CHIP	82	0.5%	1/16W
R4019	1-208-861-81	METAL CHIP	82	0.5%	1/16W
R4020	1-218-935-11	RES-CHIP	33	5%	1/16W
R4021	1-208-861-81	METAL CHIP	82	0.5%	1/16W

Ref. No.	Part No.	Description			
R4022	1-218-935-11	RES-CHIP	33	5%	1/16W
R4023	1-218-933-11	RES-CHIP	22	5%	1/16W
R4024	1-218-935-11	RES-CHIP	33	5%	1/16W
R4025	1-218-935-11	RES-CHIP	33	5%	1/16W
R4026	1-218-935-11	RES-CHIP	33	5%	1/16W
R4028	1-218-935-11	RES-CHIP	33	5%	1/16W
R4029	1-218-935-11	RES-CHIP	33	5%	1/16W
R4030	1-218-935-11	RES-CHIP	33	5%	1/16W
R4031	1-218-935-11	RES-CHIP	33	5%	1/16W
R4032	1-218-935-11	RES-CHIP	33	5%	1/16W
R4033	1-218-935-11	RES-CHIP	33	5%	1/16W
R4034	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4035	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4036	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R4037	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4038	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R4039	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4040	1-218-977-11	RES-CHIP	100K	5%	1/16W
R4042	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R4043	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4047	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4050	1-208-855-81	METAL CHIP	47	0.5%	1/16W
R4051	1-218-953-11	RES-CHIP	1K	5%	1/16W
R4055	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R4056	1-218-990-81	SHORT CHIP	0		
R4057	1-218-990-81	SHORT CHIP	0		
R4058	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R4059	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R4060	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R4061	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R4062	1-208-906-81	METAL CHIP	6.2K	0.5%	1/16W
R4063	1-208-663-11	METAL CHIP	150	0.5%	1/16W
R4064	1-218-938-11	RES-CHIP	56	5%	1/16W
R4065	1-218-938-11	RES-CHIP	56	5%	1/16W
R4066	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R4067	1-218-938-11	RES-CHIP	56	5%	1/16W
R4068	1-218-938-11	RES-CHIP	56	5%	1/16W
R4069	1-216-864-11	SHORT CHIP	0		
R4070	1-216-864-11	SHORT CHIP	0		
R4071	1-216-864-11	SHORT CHIP	0		
R5018	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5020	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5021	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5022	1-218-935-11	RES-CHIP	33	5%	1/16W
R5023	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5024	1-218-938-11	RES-CHIP	56	5%	1/16W
R5027	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R5028	1-218-990-81	SHORT CHIP	0		
R5034	1-208-923-11	METAL CHIP	33K	0.5%	1/16W
R5035	1-218-953-11	RES-CHIP	1K	5%	1/16W
R5036	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5037	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5038	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5039	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5040	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5041	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R5046	1-218-941-81	RES-CHIP	100	5%	1/16W

Ref. No.	Part No.	Description
		< VIBRATOR >
X4001	1-781-045-21	VIBRATOR, CRYSTAL (24.576MHz)
* X5001	1-813-856-11	OSCILLATOR, CRYSTAL (27MHz)

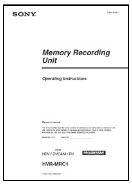
• EXCEPT J MODEL

Checking supplied accessories.



CD-ROM (Note)
"Manuals for Digital HD Video Camera Recorder"

Note: HVR-MRC1 is the accessory of HDR-Z7J/Z7U/Z7N/Z7E/Z7P/Z7C and HDR-S270J/S270U/S270N/S270E/S270P/S270C.
Please refer to following CD-ROM that is those accessory for the Operating Instructions.
- 3-280-845-01 (for HDR-Z7J/Z7U/Z7N/Z7E/Z7P/Z7C)
- 3-280-849-01 (for HDR-S270J/S270U/S270N/S270E/S270P/S270C)



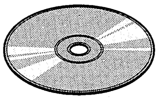
Operating Instructions (PDF)

The CD-ROM supplied contains all of language version of the Operating Instructions (PDF) for printing.
- The printed matter is not supplied. If required, please order it with the part number below.
- (Only for destination Japanese model)
  日本国内については日本語のみが印刷での部品供給可能です。

＊ 3-290-149-01 (JAPANESE)
＊ 3-290-149-11 (ENGLISH)
＊ 3-290-149-21 (FRENCH)
＊ 3-290-149-31 (SPANISH)
＊ 3-290-149-41 (ITALIAN)
＊ 3-290-149-51 (GERMAN)
＊ 3-290-149-61 (SIMPLIFIED CHINESE)

• J MODEL

付属品



CD-ROM (Note)
「Manuals for Digital HD Video Camera Recorder」

Note: HVR-MRC1はHDR-Z7J/Z7U/Z7N/Z7E/Z7P/Z7C及びHDR-S270J/S270U/S270N/S270E/S270P/S270Cの付属品です。
取扱説明書についてはそちらに付属の下記CD-ROMを参照してください。
- 3-280-845-01 (HDR-Z7J/Z7U/Z7N/Z7E/Z7P/Z7C用)
- 3-280-849-01 (HDR-S270J/S270U/S270N/S270E/S270P/S270C用)



取扱説明書 (PDF)

印刷用の取扱説明書（PDF）は全ての言語が付属品のCD-ROMに含まれています。
- 印刷物は付属されておりません。
  必要な場合は下記部品番号にて注文となります。

＊ 3-290-149-01 (日本語)

6. ADJUSTMENTS

6-1. Reading/Clearing of History Information

The history information recorded in this set can be read and cleared by connecting the set to the PC with the i.LINK cable and using batch files.

• Kind of history information

This set records the following history information:
① Error codes (latest 10 codes)
② Accumulated POWER ON time (in minute)
③ Accumulated recording time (in minute)
④ Accumulated playback time (in minute)
⑤ Accumulated files created
⑥ Accumulated CF card detection count

1-1. Connection and Power ON Method

• Connection Diagram

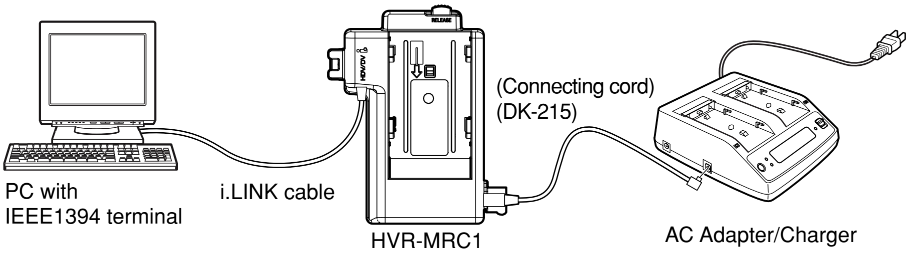


Fig. 6-1-1

Procedures

1) Attach the iLINK cradle (HVRA-CR1) to the set.
2) Connect the set to the PC with the i.LINK cable.
   Note: Remove the Compact Flash card if it has been inserted in the set.
3) Slide the POWER switch of this set to ON.
4) Check that the LCD screen of the set changes from “Welcome” to a blinking state of CF icon as shown below.

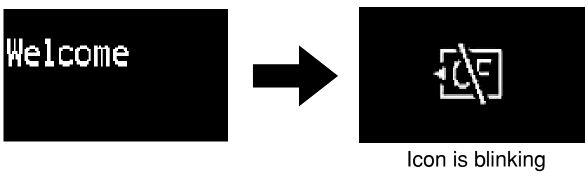
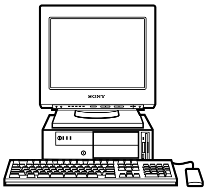


Fig. 6-1-2

1-2. List of Service Tools

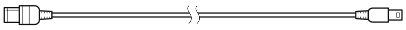
J-1



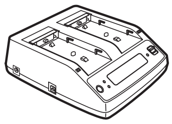
Personal computer
(Note 1)

J-2

iLINK cable
(Commercial item)



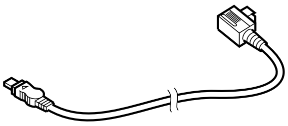
J-3



AC Adaptor/Charger
(AC-VQ1050)
1-479-580-11

J-4

Connecting cord
(DK-215)
1-783-710-24



• Files used

Folder Name	File Name	Remarks
Uploader	1394API.dll	For installation of exclusive driver
	1394DIAG.sys	
	1394vdev.inf	
	1394vdev.sys	
	port95nt.exe	
	CMD1394.exe	
	tnf.exe	
batch_e	HISTORY_E.bat	Reading of history information
(English version)	ERROR_E.bat	Clearing of error code history
	POWER_E.bat	Clearing of accumulated POWER ON time
	REC_E.bat	Clearing of accumulated recording time
	PB_E.bat	Clearing of accumulated playback time
	FILE_E.bat	Clearing of accumulated files created
	CFDET_E.bat	Clearing of accumulated CF detection count
batch_j	HISTORY.bat	Reading of history information
(Japanese version)	ERROR.bat	Clearing of error code history
	POWER.bat	Clearing of accumulated POWER ON time
	REC.bat	Clearing of accumulated recording time
	PB.bat	Clearing of accumulated playback time
	FILE.bat	Clearing of accumulated files created
	CFDET.bat	Clearing of accumulated CF detection count

Note 1: OS: Windows XP HomeEdition (Service Pack2 or later)
Windows XP Professional (Service Pack2 or later)
Standard installation is required.
Operation is not assured if rhe above OS has been upgraded.
CPU: MMX Pentium 200 MHz or faster
IEEE1394 terminal (DV connector)

Note 2: Retrieve the batch file etc. used from the item of “ESI Jig & Software” of “ESI homepage” by the following conditions
Model Name: HVR-MRC1
Category: MPU/ROM/Software

1-3. Installation of Driver

Install the driver exclusive for confirmation of HVR-MRC1.
Install the driver in the following procedures. Once this work is performed, further installation is not required later on.

Note: If the PC restarts after the driver installation completes, starts from the procedure No. 15.

1. Double-click “Port95nt.exe” in the Uploader folder.
2. According to the installation wizard, begin the installation.
3. After the installation completes, restart the PC.
4. After restarted, open “Control Panel” → “Add Hardware”, and click “Next”.



Fig. 6-1-3

5. Select “Yes, I have already connected the hardware” and click “Next’.

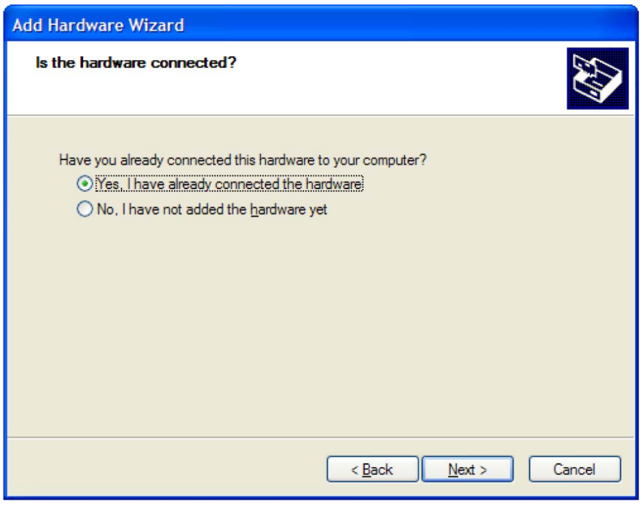


Fig. 6-1-4

6. Select “Add a new hardware device” and click “Next”.

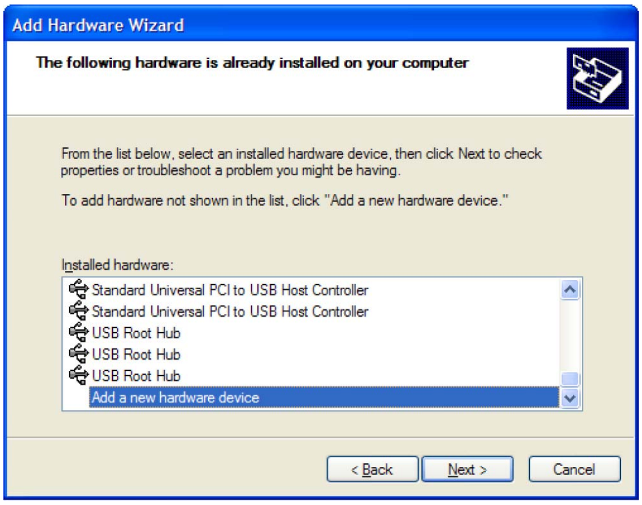


Fig. 6-1-5

7. Select “Install the hardware that I manually selected from a list” and click “Next”.

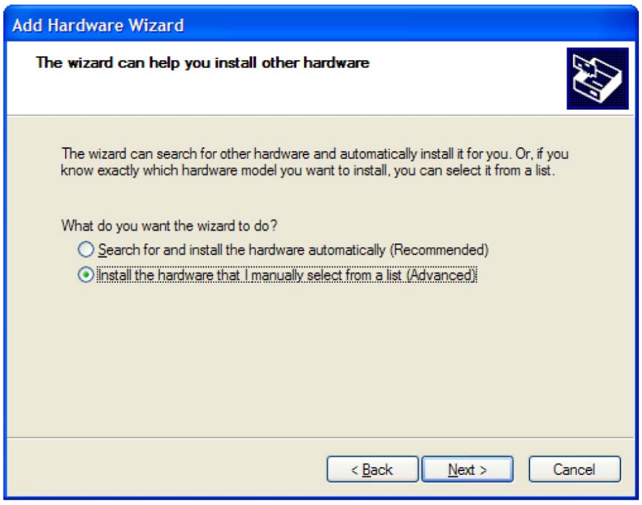


Fig. 6-1-6

8. Select “Show All Devices” and click “Next”.

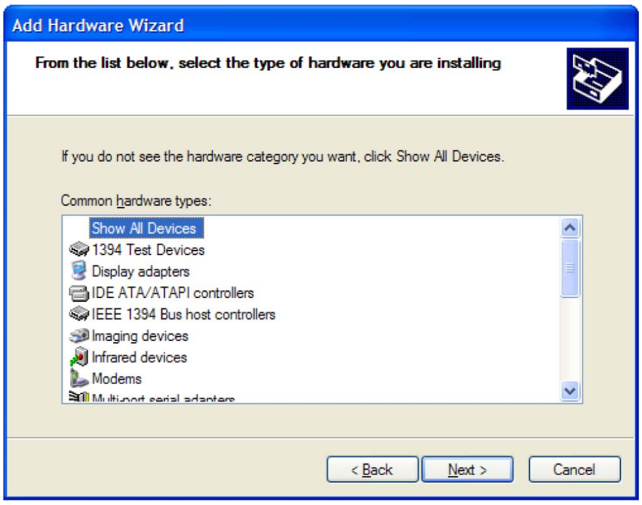


Fig. 6-1-7

9. Click “Have Disk”.

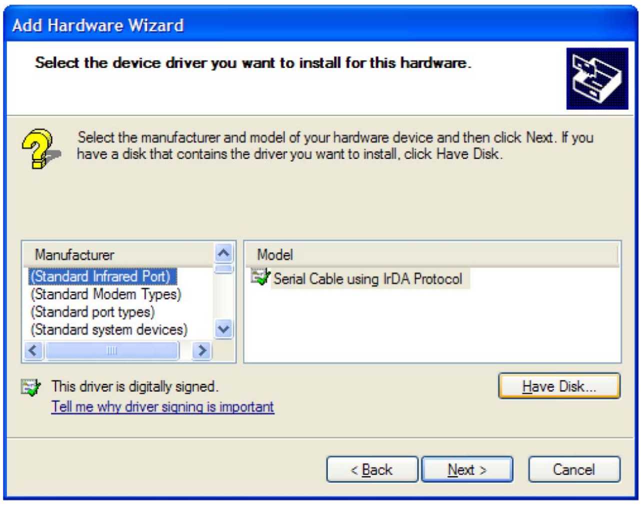


Fig. 6-1-8

10. Click “Browse”.

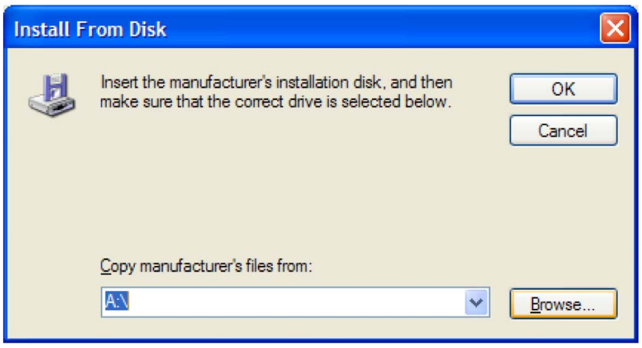


Fig. 6-1-9

11. Select “1394vdev.inf” copied to the PC and click “Open”.

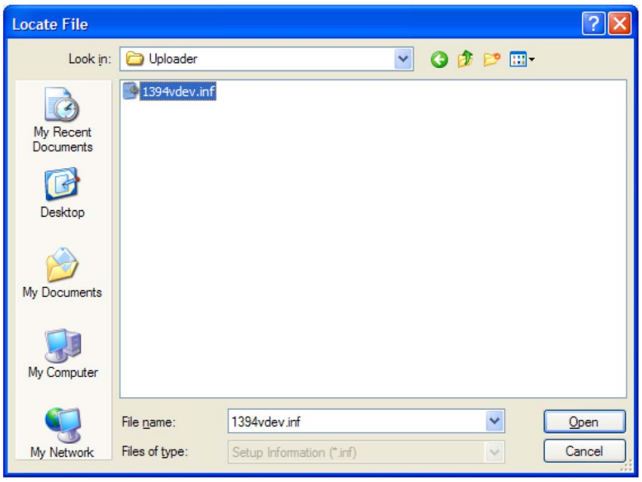


Fig. 6-1-10

12. Click “OK”.

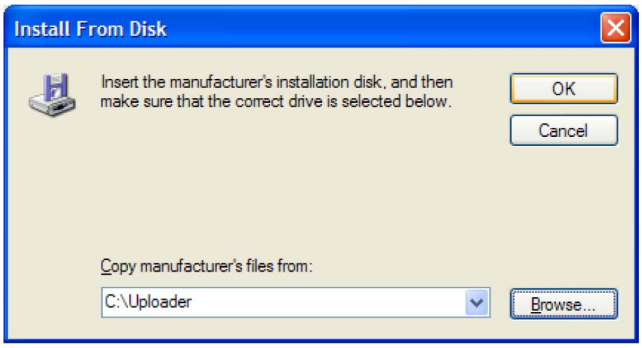


Fig. 6-1-11

13. Select “1394 Virtual Device” and click “Next”.

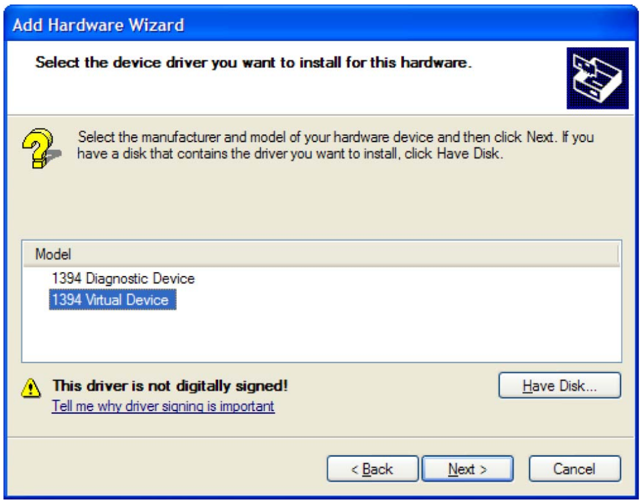


Fig. 6-1-12

14. Click “Next”. Then, the installation starts.

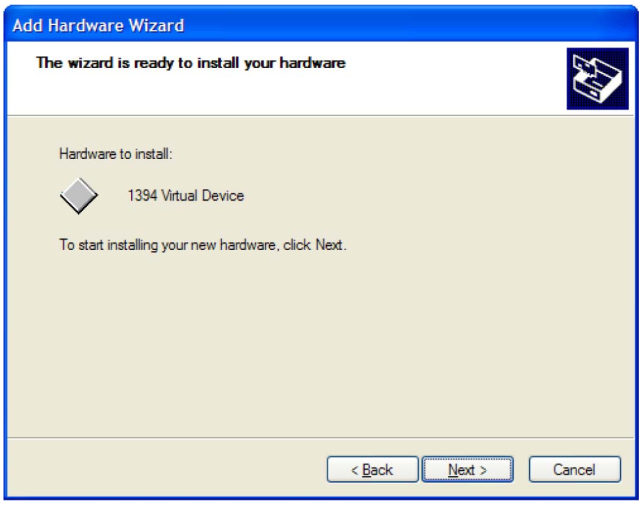


Fig. 6-1-13

Note: When driver is installed, personaol computer might be re-set.
In this case, please proceed work from procedure 15 after starting the personal computer.

15. Confirm the result of driver installation.
Open “System Properties” → “Device Manager”.

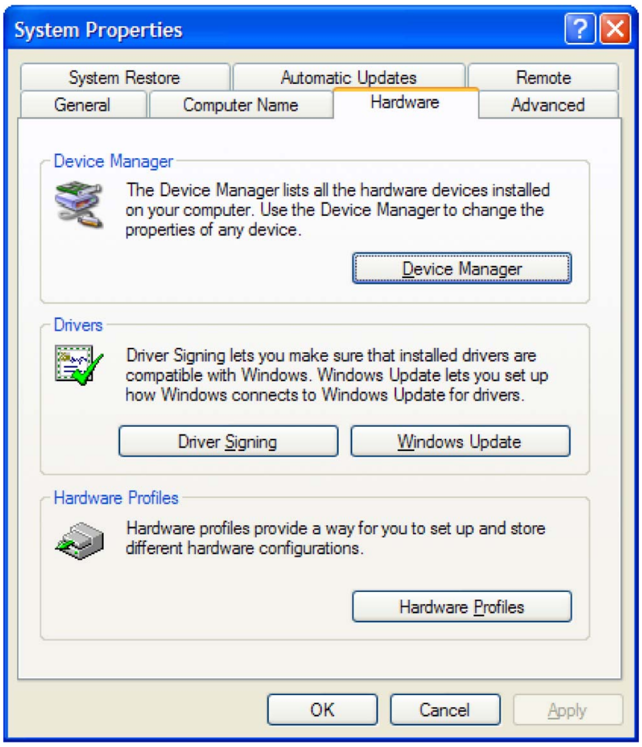


Fig. 6-1-14

16. If “1394 Virtual device” is displayed below “1394 Test Devices”, the installation is normally finished.

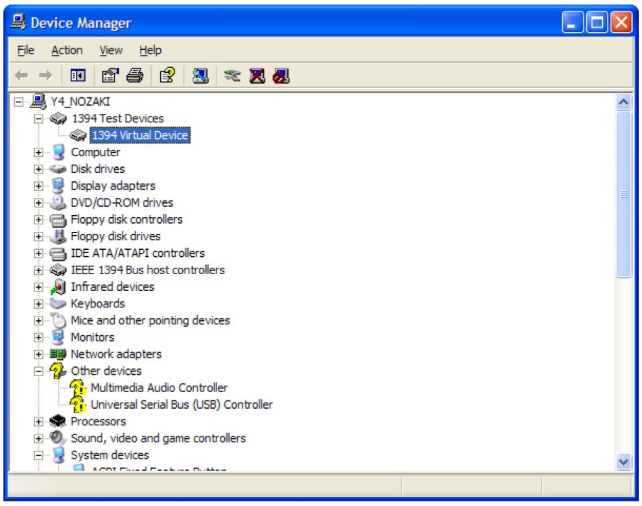


Fig. 6-1-15

17. If “Unknown device” is displayed below “1394 Test Devices”, update the driver in the procedures below.

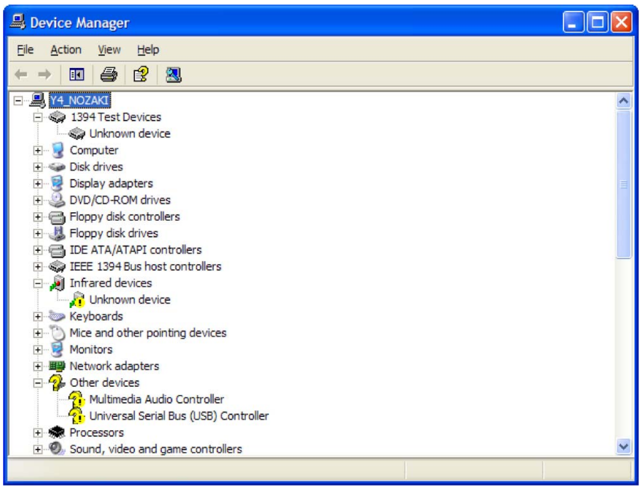


Fig. 6-1-16

18. Right-click “Unknown devices” and select “Update Driver”.

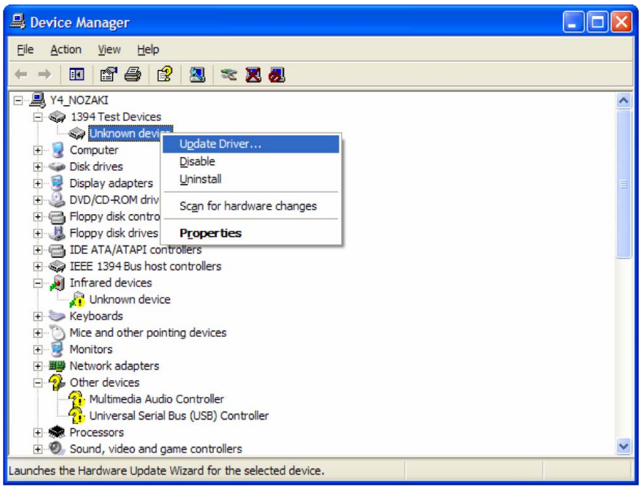


Fig. 6-1-17

19. Select “Install from a list or specific location” and click “Next”.



Fig. 6-1-18

20. Click “Browse”.

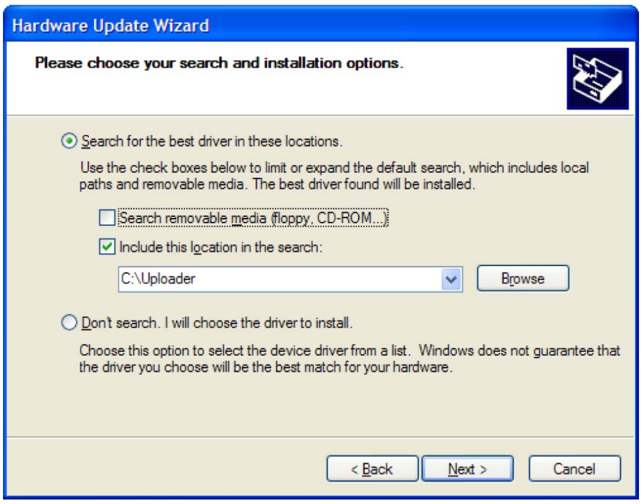


Fig. 6-1-19

21. Specify the location (Uploader) where the driver is saved and click “OK”.
The installation starts.

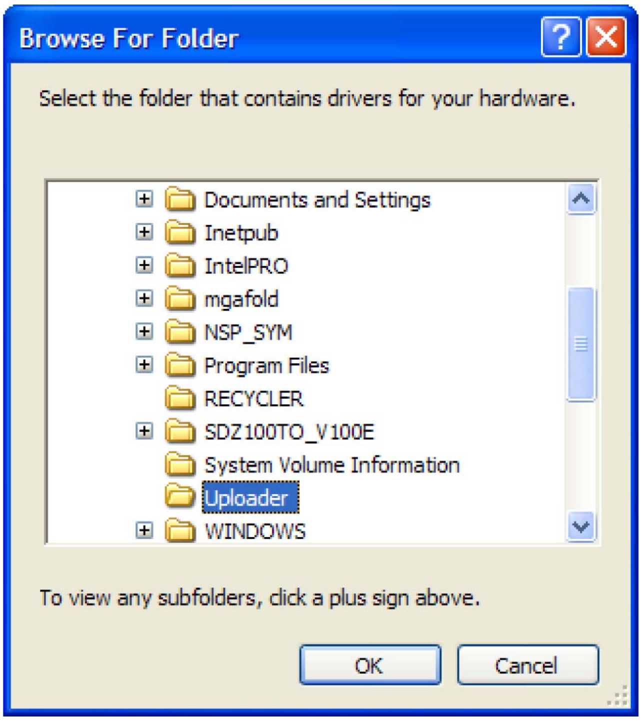


Fig. 6-1-20

22. After the installation completes, click “Finish”.
23. Open “Device Manager”. If “1384 Virtual Devices” is displayed below “1394 Test Devices”, the installation is normally finished.

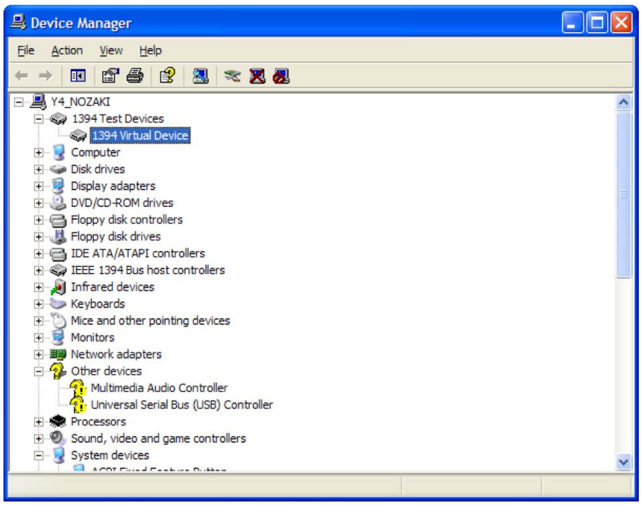


Fig. 6-1-21

1-4. Reading of History Information

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use "HISTORY.bat".

Procedures

1. Double-click "HISTORY_E.bat" copied to the PC.
2. The command prompt starts up. Following the message, press the [ENTER] key of PC.

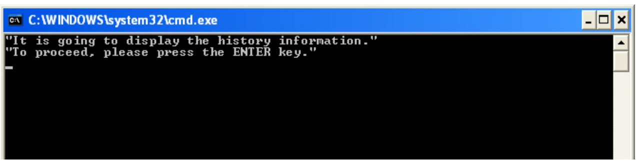


Fig. 6-1-22

3. The Notepad will open automatically and display the history information.

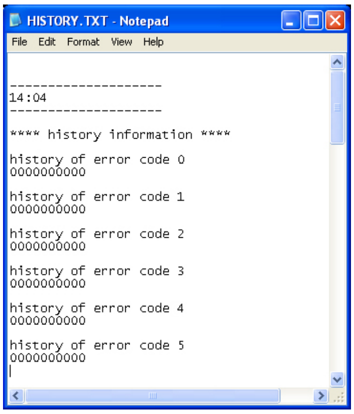


Fig. 6-1-23

4. Close the Notepad. The command prompt window will close automatically.
5. The history information file "HISTORY.TXT" is created in the same folder as HISTORY_E.bat, and accordingly you can see the history information by opening the file with the text editor, etc.
   If you execute HISTORY_E.bat with the HISTORY.TXT already created, new history information will be added to the HISTORY.TXT with previously read history information remained unchanged.

1-5. Clearing of Error Code History

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use "ERROR.bat".

Procedures

1. Double-click "ERROR_E.bat" copied to the PC.
2. The command prompt starts up.

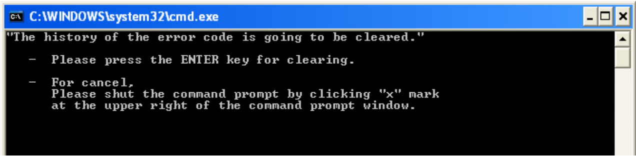


Fig. 6-1-24

- To execute, press the [ENTER] key of PC. The clearing of error code history will be executed.
- To cancel, click "x" mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of error code history finished, the following message will be displayed in the command prompt window.

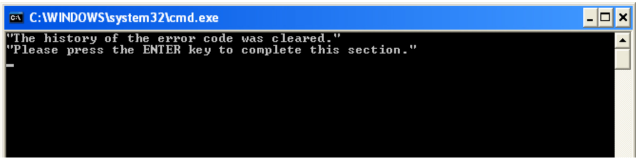


Fig. 6-1-25

4. Press the [ENTER] key of PC to close the command prompt window.

1-6. Clearing of Accumulated POWER ON Time

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use “POWER.bat”.

Procedures

1. Double-click “POWER_E.bat” copied to the PC.
2. The command prompt starts up.

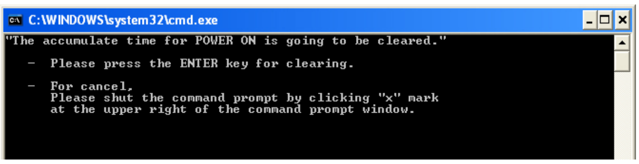


Fig. 6-1-26

- To execute, press the [ENTER] key of PC. The clearing of accumulated POWER ON time will be executed.
- To cancel, click “x” mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of accumulated POWER ON time finished, the following message will be displayed in the command prompt window.

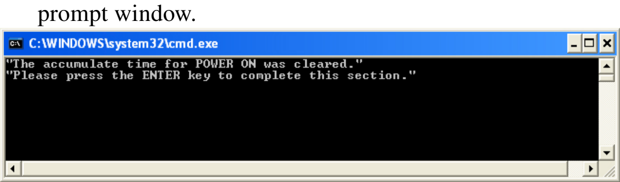


Fig. 6-1-27

4. Press the [ENTER] key of PC to close the command prompt window.

1-7. Clearing of Accumulated Recording Time

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use “REC.bat”.

Procedures

1. Double-click “REC_E.bat” copied to the PC.
2. The command prompt starts up.

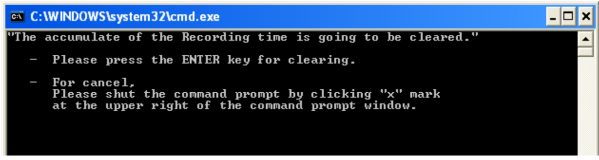


Fig. 6-1-28

- To execute, press the [ENTER] key of PC. The clearing of accumulated recording time will be executed.
- To cancel, click “x” mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of accumulated recording time finished, the following message will be displayed in the command prompt window.

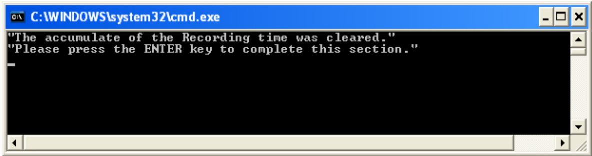


Fig. 6-1-29

4. Press the [ENTER] key of PC to close the command prompt window.

1-8. Clearing of Accumulated Playback Time

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use "PB.bat".

Procedures

1. Double-click "PB_E.bat" copied to the PC.
2. The command prompt starts up.

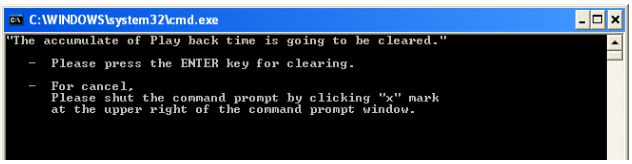


Fig. 6-1-30

- To execute, press the [ENTER] key of PC. The clearing of accumulated playback time will be executed.
- To cancel, click "x" mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of accumulated playback time finished, the following message will be displayed in the command prompt window.



Fig. 6-1-31

4. Press the [ENTER] key of PC to close the command prompt window.

1-9. Clearing of Accumulated Files Created

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use "FILE.bat".

Procedures

1. Double-click "FILE_E.bat" copied to the PC.
2. The command prompt starts up.

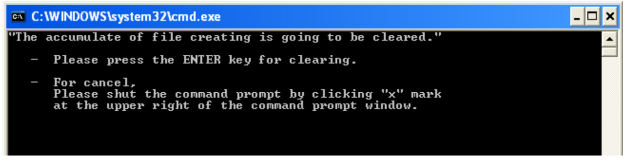


Fig. 6-1-32

- To execute, press the [ENTER] key of PC. The clearing of accumulated files created will be executed.
- To cancel, click "x" mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of accumulated files created finished, the following message will be displayed in the command prompt window.

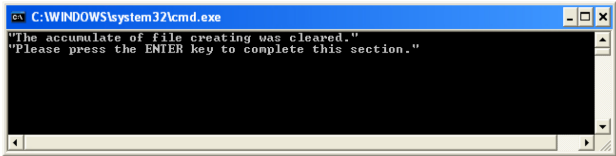


Fig. 6-1-33

4. Press the [ENTER] key of PC to close the command prompt window.

1-10. Clearing of Accumulated CF Detection Count

Note: The following shows a case that uses the batch file of English version.
For Japanese version, use "CFDET.bat".

Procedures

1. Double-click "CFDET_E.bat" copied to the PC.
2. The command prompt starts up.

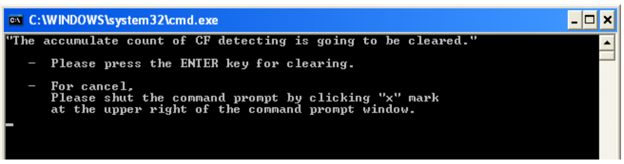


Fig. 6-1-34

- To execute, press the ENTER key of PC. The clearing of accumulated CF detection count will be executed.
- To cancel, click "x" mark at the upper right of the command prompt window to close the command prompt window.

3. When the clearing of accumulated CF detection count finished, the following message will be displayed in the command prompt window.

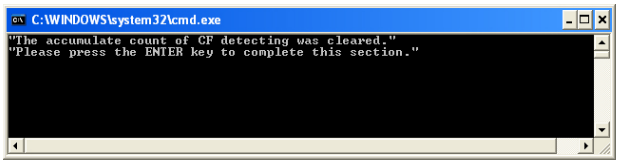


Fig. 6-1-35

4. Press the ENTER key of PC to close the command prompt window.

SONY

3-290-149-**11**(1)

Memory Recording Unit

Operating Instructions

Owner's record

The model number and the serial number are located at the name plate on the left of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. HVR-   Serial No. ______________________

FOR
HDV / DVCAM / DV

PROGRESSIVE

HVR-MRC1

Table of contents

On trademarks

Notes on the License

Overview

Integrated architecture to the camcorder

- The body is small and light with a weight of about 130 g and connects directly to a camcorder without a cable to provide camcorder mobility. Power is supplied from the camcorder so no additional battery is required; weight and size have thus been minimized. The power-saving design also enables longer recording time.
- The operational status such as operating mode, remaining CompactFlash capacity or recording format, etc. can be checked on the LCD screen of the camcorder. Not having to check the unit itself means you can concentrate more on what you are shooting.
- The camcorder used with this unit can output a record command without a tape inserted. This synchronizes the unit to the REC/STOP operation of the camcorder and so audio and video can be recorded on the CompactFlash unit only. A loop recording mode is also available which enables you to record repeatedly.

Recording on small, light and highly versatile CompactFlash

- CompactFlash used as recording media
- CompactFlash is less subject to strong vibration or high altitude and are highly resistant to impact such as being dropped. This enables recording in a wide range of environments.
- A highly versatile CompactFlash media (16GB) enables about 1 hour and 12 minutes of recording of an HDV/DVCAM/DV stream.
- Connecting the unit to a computer via a commercial CompactFlash reader allows faster data transfer to the computer than when using a tape. The data transfer time depends on the specifications of the CompactFlash media and CompactFlash reader.

Can also connect to the HVRA-CR1 i.LINK cradle

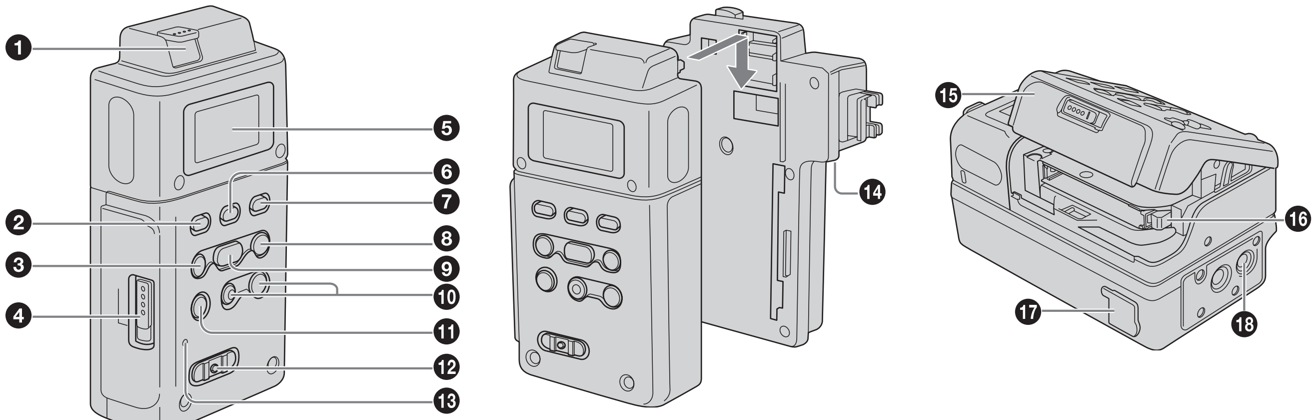
- The unit can be connected to a computer or camcorder via the HVRA-CR1 i.LINK cradle.
- The unit operates with a battery or AC adaptor via the HVRA-CR1 i.LINK cradle, which enables you to record in a wide range of environments.
- This unit has two operating modes, VIDEO mode and COMPUTER mode. The mode is automatically selected depending on which device is connected. The unit independently outputs playback video to the i.LINK interface.
- VIDEO mode is for recording and playback an HDV/DVCAM/DV stream via the i.LINK terminal of the camcorder.
- COMPUTER mode enables the unit to be recognized as an external drive when connected to a computer via an i.LINK terminal. This mode enables high-speed data transfer.

Supported models

- This unit can be connected to a camcorder via a special interface.
- Refer to the supplied “Guide to supported models and their functions” for details on supported models when connecting via an i.LINK terminal.

Names of parts

Memory Recording Unit / i.LINK Cradle



Attaching to the i.LINK cradle
Attach this unit to the i.LINK cradle by sliding the unit in the direction of the arrow.

❶ RELEASE button
Press this button to remove this unit.

❷ CAM LINK button
Press this button to switch to CAM LINK [ON] (FOLLOW/SYNCHRO) to record video in conjunction with the recording operation of the camcorder, or to CAM LINK [OFF] to record with this unit alone.
* Default setting is CAM LINK [ON].

❸ PREVIOUS/REW button
Press this button during standby to go back to the previous clip.
Press this button during playback to stop playback and restart playback from the beginning of the current clip.
Keep this button pressed down during playback to play the current clip backwards at triple the normal speed.
When the menu screen is displayed on the LCD screen, press this button to move the cursor.

❹ CompactFlash slot door OPEN latch
Slide the button to open the CompactFlash slot door. If the CompactFlash door is opened while the CompactFlash is being accessed, such as when recording or during playback, operations will stop.

❺ LCD screen

❻ MENU/LCD BACK LIGHT button
Press this button to display the menu screen on the LCD screen.
Press the MENU/LCD BACK LIGHT button long enough for the backlight of the LCD screen to come on or off.

❼ REPEAT button
Press this button to change the auto repeat mode.
Each time you press the button, the mode cycles through each of the following changes.
REPEAT1 (Repeatedly plays back the selected clip only)/ ALL REPEAT (Repeatedly plays back all clips)/OFF

❽ NEXT/FF button
Press this button during standby to go to the next clip.
Press this button during playback to stop playback and restart playback from the beginning of the next clip.
Keep this button pressed down during playback to play the current clip forwards at triple the normal speed.
When the menu screen is displayed on the LCD screen, press this button to move the cursor.

❾ PLAY/EXEC button
Press this button to play recorded files.
Press this button during playback to pause playback.
When the menu screen is displayed on the LCD screen, press this button to execute the selected menu item.

❿ REC button
Press two buttons together to start recording.

⓫ STOP button
Press this button to return to the VIDEO mode screen.
Press this button to stop recording or playback.
When a menu is selected, press this button to cancel it.

⓬ POWER switch
Press this button to turn the power of this unit on or off.
The VIDEO mode and COMPUTER mode switch automatically.

⓭ REC lamp/Access lamp
REC lamp/Access lamp comes on during recording in VIDEO mode.
REC lamp/Access lamp blinks while accessing the computer in COMPUTER mode.

⓮ i HDV/DV terminal
Connect to a camcorder or computer with an i.LINK cable.

⓯ CompactFlash slot door

⓰ Eject lever
Press this lever to eject the CompactFlash.

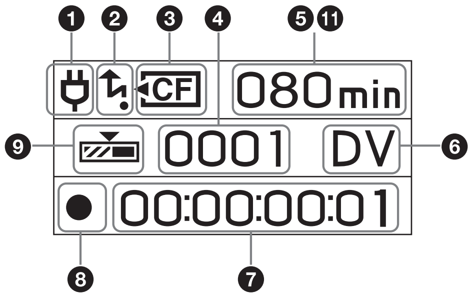
⓱ DC IN (DC power input) terminal
Connect the AC adaptor etc. to supply power to this unit.

⓲ Attachment screw hole
This unit enables mounting to the camcorder equipped a cold shoe or to directly mount to a tripod using the optional shoe adaptor.
Use a tripod with 5.5 mm or shorter screws.

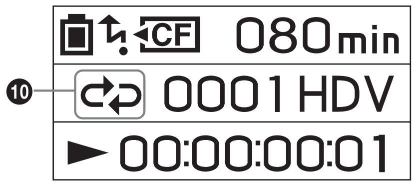
LCD screen display

VIDEO mode

During recording



During playback



❶ **Power supply display**
This icon is not displayed when this unit is connected directly to the camcorder.
Displays the power supply icons when connected to a PC or camcorder using the i.LINK cradle.

Battery pack in use
Display the remaining battery capacity.

AC adapter connected

❷ **CAM LINK mode display**
When the CAM LINK is set to ON, this icon is on.
When the CAM LINK is set to OFF, this icon is off.

❸ **CompactFlash display**
Remains on under normal conditions.
Starts blinking in the following situations.
- When the remaining recording time is less than 5 minutes
- When the CompactFlash slot door is open
- When the clip number is 9999

❹ **Clip number display**
Displays the selected clip number or recording/playback clip number.

❺ **Remaining CompactFlash capacity display**
Displays the remaining recording time (in minutes).

❻ **Format type display**
Displays the recording/playback clip format.

❼ **TC (time code) display**
Displays the time code.

❽ **Status display**
Displays the status with an icon.
■ Power is on and playback/recording is stopped
● Recording
► Playback
►II Pausing playback
►► Fast-forward
◄◄ Rewind

❾ **REC mode display**
Displays REC mode setting in the menu.
NORMAL Not displayed.

Cache recording mode

Interval recording mode

Loop recording mode

❿ **Repeat mode display**
Displays the repeat status during playback.

REPEAT 1

REPEAT ALL

⓫ **Loop recording display**
Time display of ❺ is the total time recorded by loop recording.
Displays [L] to the left of the time display.

Using in VIDEO mode

Connecting this unit to a camcorder

Refer to the operating instructions of the camcorder. Connecting the shoe connector of the unit enables the camcorder to supply power and a stream signal.

Inserting/removing optional memory media

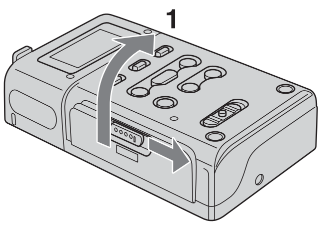
- Although this unit has been tested with CompactFlash, Sony does not guarantee its operation with all CompactFlash.
  The operation of this unit with Sony CompactFlash has been checked.
- CompactFlash with 133x 2GB or more specifications are recommended for this unit. (A speed of less than 133x is not guaranteed; space less than 2GB is not guaranteed.)
- Always format a new CompactFlash with this unit before use.
- Do not remove the CompactFlash while the access lamp is blinking.

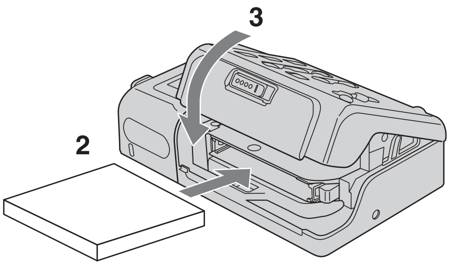
Inserting the CompactFlash

1 **Open the CompactFlash slot door while sliding the OPEN latch.**

2 **Push the CompactFlash in the correct direction until it clicks into place.**

3 **Close the CompactFlash slot door.**

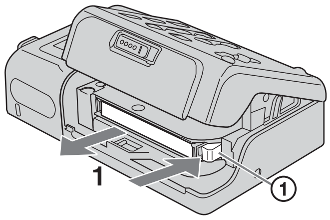




Removing the CompactFlash

1 **Open the CompactFlash slot door and push the eject lever ① to remove the CompactFlash.**

2 **Close the CompactFlash slot door.**



CompactFlash capacity and available recording time

CompactFlash	available recording time
2GB	Approx. 9 min.
4GB	Approx. 18 min.
8GB	Approx. 36 min.
16GB	Approx. 72 min.

Notes

Do not repeatedly insert or remove the CompactFlash over a short amount of time. Doing so may cause mis-recognition of the CompactFlash and memory malfunction. If you open the CompactFlash slot door while the unit is recording or in playback, operations will stop. If that occurs, be sure that the status on the LCD screen changes to ■ (playback/recording is stopped) before removing the CompactFlash.
When ejecting the CompactFlash, forcefully pressing the eject lever and allowing the CompactFlash to be pointed downward when ejected will cause the CompactFlash to fall.

Menu settings

Check the individual settings and change them if necessary. For details, see page 7.

1 **Display the menu screen on the LCD screen by pressing the MENU button.**

2 **Select the desired setting by pressing the PREVIOUS/REW button or the NEXT/FF button and press the PLAY/EXEC button.**

3 **Select the desired item by pressing the PREVIOUS/REW button or the NEXT/FF button and press the PLAY/EXEC button.**

4 **Return to the VIDEO mode screen by pressing the STOP button. Press the MENU button to close the menu screen.**

Notes

You cannot record or play back movies while the menu screen is displayed on the LCD screen. Also, you cannot change to the menu screen on the LCD screen during recording or playback.

Menu organization (VIDEO mode)

- root
  - CLIP SELECT
  - DELETE
    - CLIP
    - ALL
    - FORMAT
  - REC MODE
    - **NORMAL**
    - CACHE
    - INTERVAL
    - LOOP
  - i.LINK MODE
    - **AUTO**
    - HDV
    - DV
  - SETTING
    - TC FORMAT
      - **AUTO**
      - NDF
      - DF
    - DV FILETYPE
      - **AVI**
      - RAW DV
    - INTERVAL
      - REC TIME
        - **0.5sec**
        - 1sec
        - 1.5sec
        - 2sec
      - INT.TIME
        - **30sec**
        - 1min
        - 5min
        - 10min
    - CAMLINK SEL
      - **FOLLOW**
      - SYNCHRO
    - SLEEP MODE
      - **OFF**
      - 1min
      - 5min
    - CAMERA NO
  - ALL RESET

* Boldface settings are default settings.

CLIP SELECT

You can select the clip number directly.
Press the PREVIOUS/REW (previous clip/rewind) or NEXT/FF (next clip/fast-forward) button to select the number and press the PLAY/EXEC (playback/execute) button.
Select the digits one by one. The display returns to the menu after four digits are selected.
If there is no clip number, the previous clip number is selected.

DELETE

Deletes the recorded data or formats the CompactFlash.

• CLIP
Displays the three clip numbers from those displayed on the normal screen.
Selects and deletes clips.

• ALL
Deletes all the recorded clips.

• FORMAT
Formats the CompactFlash.

REC MODE

• NORMAL
Sets the normal recording mode.

• CACHE
Sets the cache recording mode.

• INTERVAL
Sets the interval recording mode. Only DVCAM/DV format is valid.

• LOOP
Sets the loop recording mode.

Notes

When inputting the stream signal from the i.LINK, INTERVAL and LOOP is valid.

i.LINK MODE

• AUTO .... Automatically switches to the camcorder recording/playback format.
• HDV .... Plays back HDV format only.
• DV .... Plays back DVCAM (DV) format only.

If there is no clip, you cannot make a selection.

SETTING

TC FORMAT
Follows the DF/NDF of the time code from the camcorder connected to this unit.
- AUTO .... Follows the time code format of the camcorder.
- NDF .... Records the time code in NDF format.
- DF .... Records the time code in DF format.

Notes

The default [AUTO] setting is NDF. If time code information from the camcorder is not obtained, this unit is set to the most recent recording setting.

DV FILE TYPE
Changes the DV recording format.
- AVI .... Records video in AVI format.
- RAW DV ... Records video in DV format.

INTERVAL
- REC TIME

Selects the interval recording time.
You can select [0.5sec], [1sec], [1.5sec] or [2sec].
- INT.TIME

Selects the interval time between recordings.
You can select [30 sec], [1 min], [5 min], or [10 min].

CAM LINK SEL
When CAM LINK is set to [ON], select the type of camcorder-linked operation.
- FOLLOW ...... Uses this setting when connecting to a camcorder that has no “external REC control” function. The unit follows the camcorder operation.
- SYNCHRO ... Uses this setting when connecting to a camcorder that has an “external REC control” function. The unit operates simultaneously with the camcorder.

SLEEP MODE
Switches the sleep mode ON/OFF.
- OFF

Sleep mode is set to OFF.
- 1min

If the i.LINK cable is disconnected and no operation is done for more than one minute, this unit automatically switches to SLEEP status.
- 5min

If the i.LINK cable is disconnected and no operation is done for more than five minutes, this unit automatically switches to SLEEP status.
To return to normal status, reconnect the i.LINK cable to this unit or turn the POWER switch off and back on.

Notes

In SLEEP MODE, this unit is not completely switched off but continues to run using low power consumption.

CAMERA NO
You can assign a number to the data clip name when recording.
Use this mode to assign non-overlapping numbers to clip names recorded simultaneously on more than one camcorder, or to manage clip data by assigning numbers.
Press the PREVIOUS/REW (previous clip/rewind) or NEXT/FF (next clip/fast-forward) button to select the number and press the PLAY/EXEC (playback/execute) button.
Select the digits one by one. The display returns to the menu after two digits are selected.
The factory default setting is [00].

ALL RESET
Restores all default settings.

Recording images from the camcorder to this unit

Images recorded by the camcorder can be recorded onto this unit.

Recording images (POWER switch at the ON side)

The different methods of recording are as follows:

- **Recording video simultaneously on this unit and a camcorder**
- **Recording on this unit during camcorder tape replacement**
- **Recording video from this unit**
- **Operating cache recording**
- **Operating interval recording**
- **Operating loop recording**

Notes

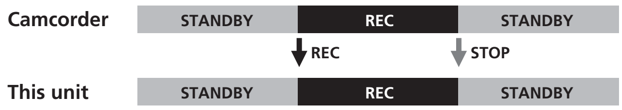
- A 0 KB file may be created, but the file cannot be opened because it does not have video data. Do not delete the 0 KB file on your computer. If you do, this clip cannot be played back.
- When changing the tape, the audio may mute on some camcorder models. At the recorded part, only video is recorded.
- When HDV recording with this unit, if you start the tape recording with the camcorder, the i.LINK output stream is cut for about 0.5 seconds, so when that video is recorded onto this unit, it is the cut form. In this case, the file will be separated before and after changing the tape recording started.
- The file will be separated automatically every time the recording time of one clip over about 20 minutes but this clip is operated as a same clip.
- If the i.LINK cable is disconnected or the power of the connecting device turned off during recording, recording stops but the data recorded until that point is recorded.
- If the power of this unit is turned off by battery exhaustion or mistakenly sliding the POWER switch, the data recorded until the power off is detected is recorded on a CompactFlash in this unit.
- If the battery pack is removed or the jack of the AC adaptor disconnected during recording, the folder information at the moment the power goes off may not be written correctly.
- The interval recording operation of the camcorder is not timed, so operations are not guaranteed.
- Do not switch the audio mode of the camcorder while recording. Depending on the PC application, there may not be any audio.

■ Recording video simultaneously on this unit and a camcorder

– Connecting to a camcorder with an "external REC control" function (SYNCHRO mode)

When connected to a camcorder that has an external REC control function, this unit can be controlled by the camcorder to record video data simultaneously to the camcorder recording on tape.

- Clips recorded by this unit include several frames after the recording stopping point on the tape.



1 **Press the CAM LINK button of this unit and set it to ON.**

2 **Set the [CAM LINK SEL] setting of this unit to [SYNCHRO].**

3 **Set the [EXT REC CTRL] setting of the camcorder to [SYNCHRONOUS].**

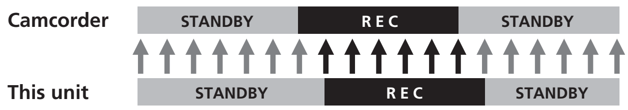
4 **Connect the camcorder to this unit via an i.LINK cable.**

5 **Press the REC START/STOP button of the camcorder to start recording.**

- The above Step 3 is for the HVR-Z7/S270 series. For details on another camcorder you want to connect to this unit, refer to the operating instructions supplied with that camcorder.
- For details on the types of camcorder that have an "external REC control" function and on motion detection, refer to the "Guide to supported models and their functions" supplied with this unit.

– Connecting to a camcorder without an "external REC control" function (FOLLOW mode)

When connected to a camcorder that has no external REC control function, this unit regularly checks the status of the camcorder and follows its recording operation.



1 **Press the CAM LINK button of this unit and set it to ON.**

2 **Set the [CAM LINK SEL] setting of this unit to [FOLLOW].**

3 **Connect the camcorder to this unit via an i.LINK cable.**

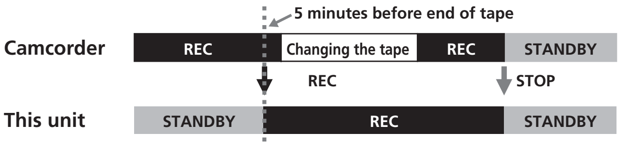
4 **Press the REC START/STOP button of the camcorder to start recording.**

Notes

- This unit may lag up to two seconds behind the tape recording/stopping point of the camcorder.
- For details on camcorders that have been tested in FOLLOW mode, refer to "Guide to supported models and their functions" supplied with this unit.

■ Recording on this unit during camcorder tape replacement

When connected to a camcorder that has an external REC control function, you can record video on this unit only while changing the tape of the camcorder.



1 **Press the CAM LINK button of this unit and set it to ON.**

2 **Set the [CAM LINK SEL] setting of this unit to [SYNCHRO].**

3 **Set the [EXT REC CTRL] setting of the camcorder to [RELAY].**

4 **Connect the camcorder to this unit via an i.LINK cable.**

5 **Press the REC START/STOP button of the camcorder to start recording.**

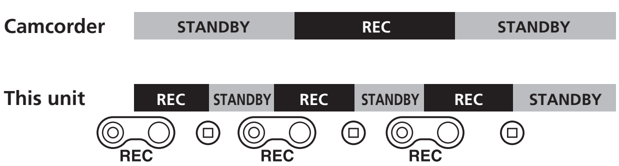
- When the remaining time of the tape is less than 5 minutes, the camcorder sends a command to this unit to start recording.
- The recording by this unit can be stopped from the camcorder after changing the tape or by pressing the STOP button of this unit.
- The noise of the tape change is recorded.
- The above Step 3 is for the HVR-Z7/S270 series. For details on another camcorder you want to connect to this unit, refer to the operating instructions supplied with that camcorder.
- For details on camcorders that have an "external REC control" function and on motion detection, refer to the "Guide to supported models and their functions" supplied with this unit.

Notes

- During RELAY recording, the cache recording cannot be operated.

■ Recording video from this unit

You can use this unit to start or stop recording a video input signal from an i.LINK without linked operation to a device connected via i.LINK.



1 **Press the CAM LINK button of this unit and set it to OFF.**

2 **Slide the REC button to start recording.**

Cache recording mode

The most recent approximately maximum 14 seconds of video and audio captured by the camcorder are held in a buffer memory and automatically recorded when the recording button is pressed.

To set cache recording

Select [CACHE] from [REC MODE] on the menu screen.

Notes

- After cache recording, it may take about 30 seconds to write data of the cache part.

Interval recording mode

Records a series of videos at regular intervals.
This function is useful to observe things like cloud movements or daylight changes. Only DVCAM/DV format is valid.

Selecting an interval recording time

Select [SETTING] → [INTERVAL] → [REC TIME] on the menu screen to set the time.
You can select [0.5sec], [1sec], [1.5sec] or [2sec].

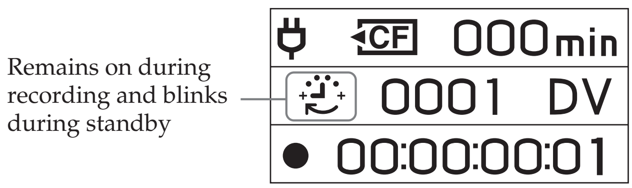
Setting the interval time

Select [SETTING] → [INTERVAL] → [INT TIME] on the menu screen to set the time.
You can select [30sec], [1min], [5min] or [10min].

Setting interval recording

Select [INTERVAL] from [REC MODE] on the menu screen.

LCD screen display in interval recording mode



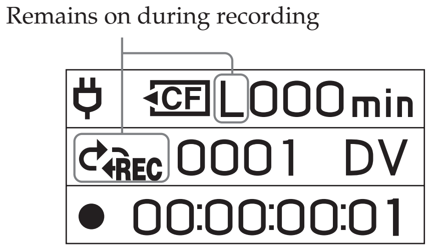
Loop recording mode

Repeats overwrite-recording using the available space on the CompactFlash.
You cannot select this mode if the remaining recording time is less than 5 minutes (CompactFlash icon is flashing).

Setting loop recording mode

Select [LOOP] from [REC MODE] on the menu screen.

LCD screen display in loop recording mode



Notes

- The speed will slow according to the volume of data being written because of limitations of the CompactFlash capacity. For that reason, the following usages are recommended when operating loop recording;
  - Use a new CompactFlash (more than 300x).
  - Format a CompactFlash before starting loop recording.
- CAM LINK is turned OFF automatically while in the interval and loop recording modes. Press the REC button to starting recording.
- The data recorded by loop recording mode is updated at regular intervals. When updating the data, the whole recording time may be shortened.
- Updates the data regardless of update intervals when starting recording by a camcorder during loop recording mode in HDV.

Playback the image recorded on a CompactFlash in this unit

To play back video clip recorded on a CompactFlash in this unit, you need to connect this unit to a playback device via an i.LINK cable.

Playback (POWER switch to ON)

The playback method is as follows.
• Standard playback
• Trick playback
• Repeat playback

To select the playback format

Select i.LINK MODE on the menu screen and select the desired setting, AUTO, HDV or DV.
For details on selecting the menu, see page 6.

– AUTO
Automatically switch the HDV/DV format signal during playback.

– HDV
Only play back the part recorded in HDV format.

– DV
Only play back the part recorded in DVCAM (DV) format.

Standard playback

In this mode, the recorded clip in this unit is output to the i.LINK depending on the type of format.

To play back normally

Select the clip number in CLIP SELECT of the menu, or display the desired clip number on the LCD screen by pressing ⏮ or ⏭.

Play back the image by pressing the ▷ button on this unit.
• When you pause during playback with this unit, no stream is output.
• During playback, the screen may become momentarily blue or frozen for about 0.5 second at the transition between scenes (when switching clips).

Trick playback

When the playback image is output to i.LINK, the clip is played at 3x, 6x, and 9x the normal speed.

To play back at the changed speed

Keep pressing ⏮ or ⏭ button during playback to start playback at the changed speed.
• The sequence of change is 3x, 6x, 9x and then back to 3x.
• It takes a few seconds for playback to start at the changed speed.
• The screen may not be displayed correctly during trick playback or playback. If that situation occurs, stop the playback once and try to replay.

Repeat playback

This unit can automatically repeat playback of all or one clip in this unit.

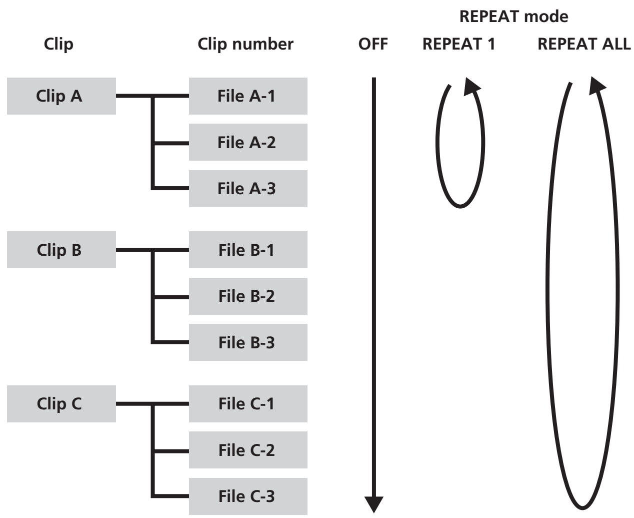
To set repeat mode

Display 🔁1 or 🔁 on the LCD screen by pressing the REPEAT button on this unit.

– 🔁1 REPEAT 1
The recorded image in the desired clip is repeatedly playback.

– 🔁 ALL REPEAT
ALL REPEAT plays back all recorded images in this unit to the last clip then goes back to the first clip and repeats playback.

– OFF
Start playback from the desired clip and stop it after playback of the last clip.



Useful functions in combination with HVR-Z7/S270

Tapeless external REC control

Even if there is no tape in the HVR-Z7/S270, you can start or stop recording the image on this unit.

Set the EXT REC CTRL setting of the HVR-Z7/S270 as follows.

- REC CTRL MODE ..... EXT ONLY
  You can start or stop recording the image on a CompactFlash in this unit with START/STOP button only. (If there is a tape in the HVR-Z7/S270, you can start recording video data with REC button of the video camera operation part, stop recording video data with STOP button of the video camera operation part on the tape.)

Tips

If there is no tape in the SYNCHRONUS or RELAY settings, you can start or stop recording the image on a CompactFlash in this unit.

- STBY COMMAND..... Desired setting

* For details, refer to the operating instructions for the external REC control of the HVR-Z7/S270.

Set this unit as follows.

- CAM LINK SEL.......... SYNCHRO
- Press the CAM LINK button to set to CAM LINK [ON].

You can record the time code of the HVR-Z7/S270 without a tape in the HVR-Z7/S270.

If you want to record video using the time code of the HVR-Z7/S270, set the time code setting of the HVR-Z7/S270 as follows.

Time code value always advances.

- TC MAKE .... PRESET
- TC RUN .... FREE RUN

Time code value only advances during recording.

- TC MAKE .... PRESET
- TC RUN .... REC RUN

In combination with the time code settings of the HVR-Z7/S270, this unit operates as follows.

TC MAKE	TC RUN	Time code of this unit with a tape in the HVR-Z7/S270	Time code of this unit without a tape in the HVR-Z7/S270
REGENERATE	–	When starting recording on a tape, video is recorded using the time code of the tape base. If the time code of the tape base cannot be read, the time code starts from 00:00:00:01.	The internal time code of this unit runs automatically.
PRESET	REC RUN	When starting recording on a tape or CompactFlash in this unit, the time code value advances from the preset time code of the HVR-Z7/S270.	When starting recording on CompactFlash in this unit, the time code value advances from the preset time code of the HVR-Z7/S270.
	FREE RUN	The preset time code value advances constantly and data is recorded using the data code.	The preset time code value advances constantly and data is recorded using the data code.

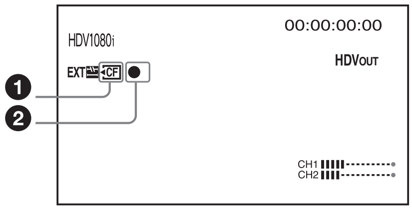
- If you want to use REC RUN with a tape in the HVR-Z7/S270, set REC CTL MODE of the HVR-Z7/S270 to [SYNCHRONOUS] and set CAM LINK SEL of this unit to [SYNCHRO].

Display the operational status of this unit on the HVR-Z7/S270 LCD screen

CAMERA mode

– Indicators

- The following information can be displayed on the LCD screen of the HVR-Z7/S270.



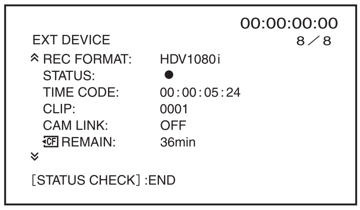
❶ **CompactFlash connecting status**
This icon blinks when the remaining recording time of the CompactFlash is low or an error has occurred in this unit.

❷ **CompactFlash mode**
The same icon as the mode icon of this unit is displayed.

CompactFlash mode	Mode icon
STANDBY	■
REC	●

– Status check indicator

- The following information can be displayed on the status check indicator (CAMERA mode) of the HVR-Z7/S270.



REC FORMAT
Displays the recording format of this unit.

STATUS
Displays the status (recording, playback etc.)

TIME CODE
Displays the time code during recording.

CLIP
Displays the clip number during recording.

CAM LINK
Displays the CAM LINK status of this unit.
(When CAM LINK [OFF] is set, you cannot record from the HVR-Z7/S270.)

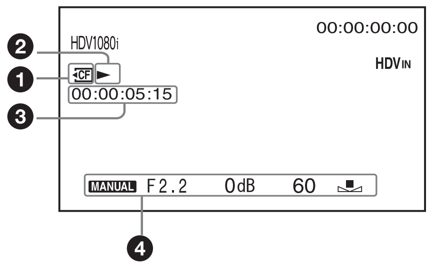
CF REMAIN
Displays the CompactFlash remaining recording time.

REMAIN
Displays the battery level.
(When connected to an AC adaptor/charger, "AC" is displayed.)
Not displayed when this unit is connected to the camcorder. It is displayed when the unit is connected to the i.LINK cradle.

VCR mode

– Indicators

- The following information can be displayed on the LCD screen of the HVR-Z7/S270.



❶ **CompactFlash connecting status**
This icon blinks when the remaining recording time of the CompactFlash is low or an error has occurred in this unit.

❷ **CompactFlash mode**
The same icon as the mode icon of this unit is displayed.

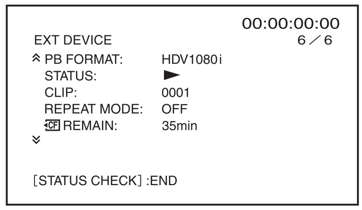
CompactFlash mode	Mode icon
STANDBY	■
PLAY	►
FF	►►
REW	◄◄
PLAY PAUSE	►II
REC	●

❸ **Time code of the playback signal of this unit**
This time code is displayed during playback of a video recorded by this unit.

❹ **Data code**
This data code is displayed during playback of a video recorded by this unit.

– Status check indicator

- The following information can be displayed on the status check indicator (VCR mode) of the HVR-Z7/S270.



PB FORMAT
Displays the playback format of this unit.

STATUS
Displays the status (recording, playback etc.)

CLIP
Displays the clip number during playback.

REPEAT MODE
Displays the playback mode. (“1” means “repeat 1 clip,” “ALL” means “repeat all clips.”)

[CF] REMAIN
Displays the CompactFlash remaining recording time.

[battery] REMAIN
Displays the battery level.
(When this unit is connected to an AC adaptor/charger, “AC” is displayed.)
Not displayed when this unit is connected to the camcorder.
It is displayed when the unit is connected to the i.LINK cradle.

Using in COMPUTER mode

Connecting to a computer

You can transfer recorded images on this unit as a file in HDV or DV format to a nonlinear editing system or computer.

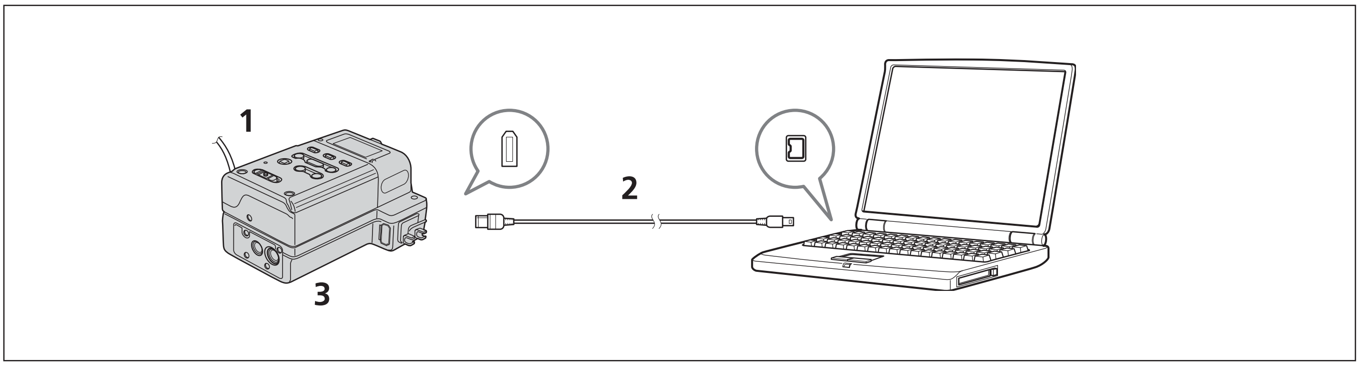
1 Attach the HVRA-CR1 i.LINK cradle and optional AC adaptor to this unit.
For extended use, the AC adaptor is recommended. This unit can still be operated with the battery pack attached.

2 Connect this unit to the computer via the optional i.LINK cable.

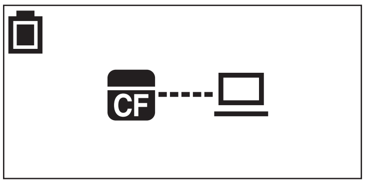
3 Slide the POWER switch of this unit to ON.

Note

This unit cannot receive power from the computer.



When this unit is set to COMPUTER mode, the following screen is displayed on the LCD screen.



Computer requirements

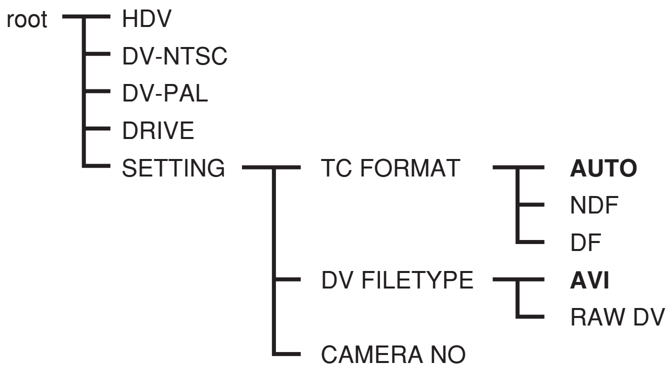
For Windows users

- OS: Windows 2000 Professional (Service Pack 4 or later)/ Windows XP Home Edition (Service Pack 2 or later)/ Windows XP Professional (Service Pack 2 or later) / Windows Vista
  Standard installation is required.
  Operation is not assured if the above OS has been upgraded.

For Macintosh users

- OS: Mac OS X (v10.3 or later)

Menu organization (COMPUTER mode)



*Boldface settings are default settings.

HDV

Operate in the VIDEO mode. Set this mode when reading or writing HDV stream data on a CompactFlash in this unit using editing software.

DV-NTSC

Operate in the VIDEO mode. Set this mode when reading or writing DV (NTSC format) stream data on a CompactFlash in this unit using the editing software.

DV-PAL

Operate in the VIDEO mode. Set this mode when reading or writing DV (PAL format) stream data on a CompactFlash in this unit using the editing software.

DRIVE

Operate as an external removable media of the computer. (Default setting)

SETTING

You can set this when in VIDEO mode.
Settings are reflected in setting in the VIDEO mode operation when connecting to a camcorder.
For details about setting, refer to "Menu organization (VIDEO mode)."

Notes

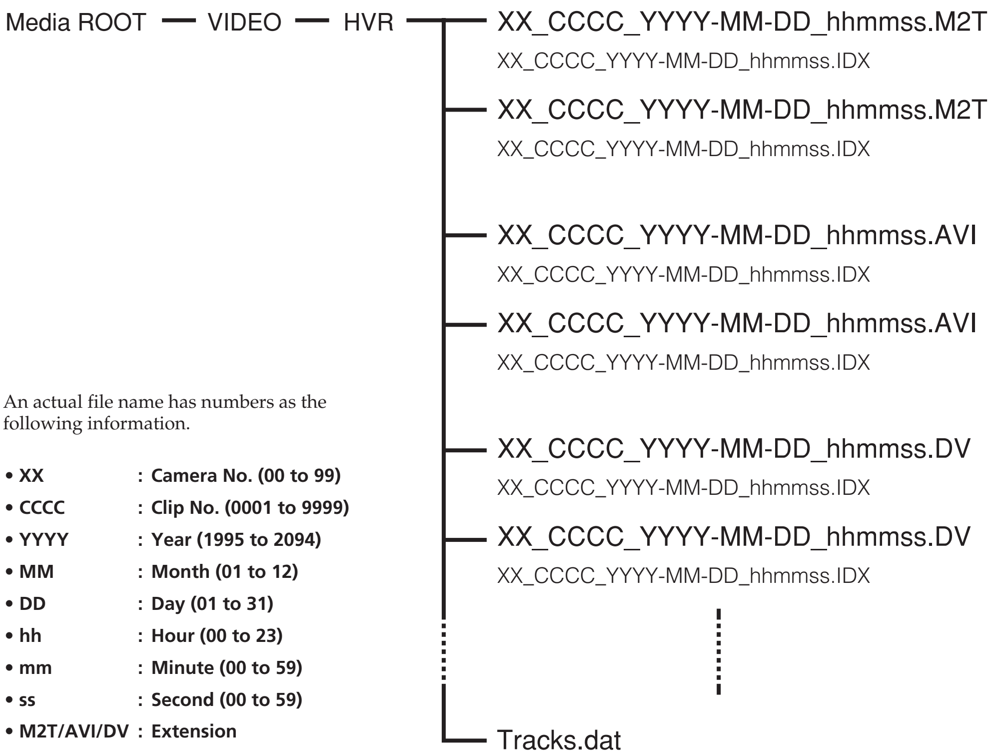
- For the following cases, operate "Safety remove Device (for Windows)" or "Remove by putting the media icon into the trash (for Mac OS)" etc., and check that the access lamp turns off.
  - When switching the each modes DRIVE, HDV or DV-NTSC, DV-PAL
  - When disconnecting the i.LINK cable from the computer
  - When turning off the power of this unit

  To recognize this unit again after these operations, disconnect i.LINK cable from the computer once, then reconnect it.
- Depending on the video editing software, this unit may not be recognized without switching the mode before starting the software.
- If you change the operation mode frequently, the computer and this unit may not communicate correctly. Switch the mode of this unit at intervals about 5 seconds or more.
- HDV, DV-NTSC, and DV-PAL mode may not be recognized because of a limitation of the computer when switching them directly.
  If that situation occurs, disconnect this unit from the computer, then select the mode.
- If the combination of the settings of the editing software (HDV/DV-NTSC, DV-PAL) and this unit are incorrect, images may be distorted or recognized incorrectly.

Folder saving format

Folder organization

The file/folder organization of this unit is as follows.



An actual file name has numbers as the following information.

- **XX : Camera No. (00 to 99)**
- **CCCC : Clip No. (0001 to 9999)**
- **YYYY : Year (1995 to 2094)**
- **MM : Month (01 to 12)**
- **DD : Day (01 to 31)**
- **hh : Hour (00 to 23)**
- **mm : Minute (00 to 59)**
- **ss : Second (00 to 59)**
- **M2T/AVI/DV : Extension**

When not setting the clock set, file name will be “xx_cccc_0000-00-00_000000.extension.”
When the file is separated, the bottom number of the file name will be counted up.
When cache recording in HDV format, the cache part may be separated as a 14-second file (maximum).

Files

The maximum file size is 4 GB. If a file size exceeds 4 GB, that file is automatically divided.

XX_CCCC_YYYY-MM-DD_hhmmss.M2T
Data recorded in HDV format
When playback, HDV compatible playback software is needed.

XX_CCCC_YYYY-MM-DD_hhmmss.AVI
DV format data recorded when DV FILE TYPE is set to AVI

XX_CCCC_YYYY-MM-DD_hhmmss.DV
DV format data recorded when DV FILE TYPE is set to RAW DV
For playback on Windows, Raw DV compatible playback software is needed.

XX_CCCC_YYYY-MM-DD_hhmmss.IDX and Tracks.dat
Information files of recording data in folders
(number of files, number of frames, starting time code, etc.)
Used with a connection tool. Do not delete this file.

Notes

- During HDV recording, a new file will be created at the recording starting point of the tape.
- Segmented files recorded from HDV stream
  Some computer applications cannot play back the transitions between segmented files properly. If this happens, join the files using the “Sony Recording Unit Utility” or “M2T File Connection Tool” (*).
  * Available from the Sony support page

Notes regarding COMPUTER mode

- Do not save other data files in the HVR folder.
- Do not transfer data from a computer to this unit in COMPUTER mode.
  Write back data from a computer to this unit by streaming.
  Write back data after selecting HDV or DV-NTSC, DV-PAL format in PC MODE in the menu.
- Do not change folder or file names on your computer.
  Delete data or format a CompactFlash on this unit to increase the capacity of the CompactFlash.
- When removing the CompactFlash media by OS operation from a computer, do not disconnect i.LINK cable or switch the mode of this unit.
- Do not use defragmentation on your computer.
- Due to the limitations of Windows, this unit may not be detected when normal computer operation is restored after standby or hibernation. For this reason, hibernation is not supported by this unit.
- Due to the specifications of Mac OS X, to disconnect this unit from a Mac with Mac OS X and connect it again, perform the following steps.

To reuse this unit

1. **To use this unit, restart the computer or use Disk Utility. To use Disk Utility, follow the steps.**
2. **Start Disk Utility (/Applications/Utilities/).**
3. **Click the triangle mark on the left of the CompactFlash icon to display the CompactFlash volume and partition name.**
4. **Select grayed out partition name (“VIDEO”) from Disk Utility window.**
5. **Select [Mount] from the [Option] menu. The selected name “VIDEO” is displayed on the desktop again.**
   (If it is still unmounted, select [Unmount] and then select [Mount] again.)
6. **Exit Disk Utility.**

Power supply

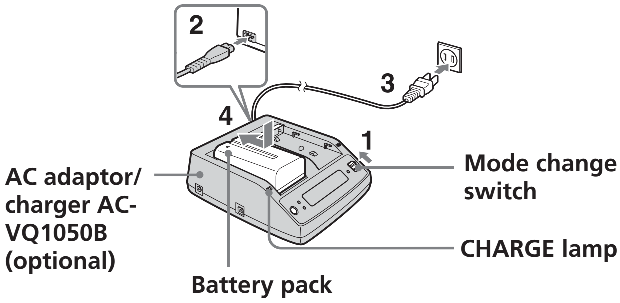
Preparing the power supply

The following will explain the optional AC-VQ1050 AC adaptor/charger.

To charge the battery pack

When using an "InfoLITHIUM" battery pack (L-series, optional) as the power supply for this unit, charge the battery back as follows before use.

When charging the battery pack, refer to the operating instructions supplied with the AC adaptor/charger (optional).



1 Set the mode change switch of the AC adaptor/ charger to CHARGE.

Notes

You cannot charge when the mode change switch is set to VCR/CAMERA.

2 Connect the AC power cord to the AC adaptor/ charger.

3 Connect the AC power cord to a wall outlet.

4 When installing the battery pack, press it down while sliding it in the direction of the arrow.
Charging begins and the CHARGE lamp on the AC adaptor/charger comes on.
When charging is completed, all of the segments of the battery life indicator appear in the display window (normal charge).
The CHARGE lamp goes off, but if you continue charging until the "FULL" battery life indicator appears, the battery capacity will be slightly longer (full charge).

5 When charging is completed, remove the battery pack from the AC adaptor/charger.

Notes

- This unit can be used with an "InfoLITHIUM" battery pack (L-series), but does not support the battery info function.
- This unit cannot be used to charge the battery pack installed.

Remaining battery time indication in the AC adaptor/charger display window

This indication is provided by data communications between the AC adaptor/charger and the "InfoLITHIUM" battery pack.
This unit does not have a data communications function, so the displayed time may differ from the actual remaining time. This is not a malfunction.

Charging time

Charging times for a completely exhausted "InfoLITHIUM" battery pack (NP-F570, NP-F770, NP-F970) are as follows.

Battery pack	Time for full charge	(Time for normal charge)
NP-F570	Approx. 145 minutes	(Approx. 85 minutes)
NP-F770	Approx. 230 minutes	(Approx. 170 minutes)
NP-F970	Approx. 310 minutes	(Approx. 250 minutes)

Operating times for continuous recording

Operating times for continuous recording using an "InfoLITHIUM" battery pack (NP-F570, NP-F770, NP-F970) are as follows.

Battery pack	Operating time from full charge	(Operating time from normal charge)
NP-F570	Approx. 420 minutes	(Approx. 380 minutes)
NP-F770	Approx. 870 minutes	(Approx. 780 minutes)
NP-F970	Approx. 1,320 minutes	(Approx. 1,180 minutes)

Battery pack

Before changing the battery pack, slide the POWER switch to OFF (CHG).

Charging/recording/playback time

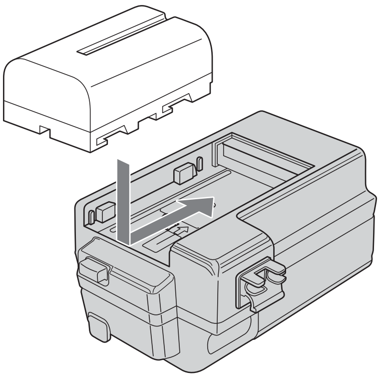
- Times measured with the camcorder at 25°C (77°F) (Recommended range is 10°C to 30°C (50°F to 86°F)).
- Recording and playback times are shorter at lower temperatures.
- Recording and playback times are shorter depending on the conditions of use of this unit.
- Except for the NP-F570/F770/F970, operating time is not ensured.

AC adaptor/charger

Do not short-circuit the DC plug of the AC adaptor/charger or battery terminal with any metallic objects. This may cause a malfunction.

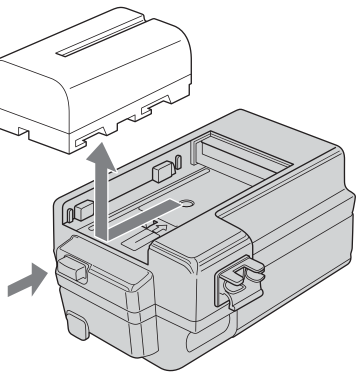
To install the battery pack to this unit

Slide the battery pack in the direction of the ◀ mark on the battery pack.



To remove the battery pack from this unit

Press the BATT RELEASE button of this unit and slide the battery pack in the direction of the arrow.



To connect this unit to a wall outlet

For prolonged operation, such as playing the recorded images, you can operate this unit from a domestic wall outlet without worrying about battery life.

1 **Set the mode change switch of the AC adaptor/charger to VCR/CAMERA.**

Notes

When the mode change switch is set to CHARGE, there is no power supply.

2 **Connect the DK cable to the DC IN jack on this unit.**

3 **Connect the DK cable to the AC adaptor/charger.**

4 **With the power cord, connect the AC adaptor/charger to a wall outlet.**

Notes

You can leave the battery pack installed while operating from AC power. The power supply to the DC IN jack has priority.

To use the AC adaptor/charger from a vehicle power supply

For details, refer to the operating instructions supplied with the AC adaptor/charger.

Notes on battery pack/AC adaptor

- Avoid the following while the ACCESS lamp is lit. Failure to do so may cause malfunction.
  - Removing the battery pack
  - Removing the AC adaptor (while charging with the AC adaptor)
- Always turn off the POWER switch before removing the battery pack or the AC adaptor.

Trouble shooting

Please check the following before contacting your Sony dealer.

Note in case of repairs

- Some kinds of repair work may require that the CompactFlash be formatted or replaced. In either case, all data on the CompactFlash will be deleted. Back-up your data from the CompactFlash before sending it for repairs. Sony does not guarantee against data being deleted during repair work.
- During repair work, Sony may perform a minimal check of the data on a CompactFlash in order to verify improvements or the occurrence of defective symptoms. However, Sony never copies or saves the data.

Power sources

Symptom	Cause/Remedy
This unit gets warm.	• This unit may get warmer while you use it. This is not a malfunction.
The remaining battery time indicator does not indicate the correct time.	• The ambient temperature is too high or too low, or the battery pack has not been charged enough. This is not a malfunction. → Fully charge the battery pack again. If the problem persists, the battery pack may be worn out. Replace it with a new one (p. 20). • The indicated time may not be correct in certain circumstances.
The battery pack discharges too quickly.	• The ambient temperature is too high or too low, or the battery pack has not been charged enough. This is not a malfunction. → Fully charge the battery pack again. If the problem persists, the battery pack may be worn out. Replace it with a new one (p. 20).

Recording

Symptom	Cause/Remedy
Pressing the REC switch does not start recording.	• This unit is writing the video you just shot to the CompactFlash. → Wait for a while and then slide the REC switch. • The CompactFlash of the unit is full. → Delete unnecessary images. → Format this unit by selecting DELETE and then FORMAT.
The ACCESS lamp remains on even when you stop recording.	• This unit is recording the image you just shot. → Do not remove the AC adaptor or the battery pack while the lamp is turned on.
Recording stops.	• Fragmentation has occurred. → Format this unit by selecting DELETE and then FORMAT.

Connecting a computer

Symptom	Cause/Remedy
An error message appears when you place the supplied CD-ROM in your computer.	→ Set the computer display as follows: – 1024 × 768 dots or more, high color (16 bits, 65,000 colors) or more.
The image or sound on this unit cannot be played back correctly.	• Depending on the computer you are using, the played back image or sound may stop temporarily, but this does not affect the images or sound copied to your computer. • Playback software is not installed on your computer. → Install playback software on your computer.
The extension of a file is not displayed on your computer.	→ To display the extension, follow the steps below. ① In the window folder, click [Tools] → [Folder option...] → [View] tab. ② Under Advanced Settings, uncheck [Hide file extensions for known file types]. ③ Click [OK].

Warning indicators

Self-diagnosis display

When an error occurs the following warning indicators may appear on the LCD screen.

Message	Cause/Corrective Action
A:□□:□□/I:□□:□□/P:□□:□□/ M:□□:□□/F:□□:□□/X:□□:□□ (Self-diagnosis display)	If an error recurs after you repeat corrective action several times, contact Sony Customer Service or the place of purchase. A:12:□ • CompactFlash-related error has occurred. → Transfer speed of the CompactFlash may be slow. Be sure that the CompactFlash you are using is the recommended type. A:19:□ • The CompactFlash you are using is not recognized. → Check the type you are using. I:12:□ • Internal error has occurred. → Turn this unit off and then back on. P:12:□ • Internal error has occurred. → Turn this unit off and then back on. P:21:□ • Internal error has occurred. → Turn this unit off and then back on. M:21:□ • Recorded image was not processed correctly. → Turn this unit off and then back on. F:11:□ • Internal error has occurred. → Turn this unit off and then back on. F:12:□ • There is a conflict in the CompactFlash logic structure. → Move the required data to the computer and reformat the CompactFlash using this unit. F:21:□ • Internal error has occurred. → Turn this unit off and then back on. F:22:□ • Internal error has occurred. → Turn this unit off and then back on. F:29:□ • Firmware is not recorded. F:91:□ • Internal error has occurred. → Turn this unit off and then back on. F:92:□ • Internal error has occurred. → Turn this unit off and then back on. X:91:□ • Internal error has occurred. → Turn this unit off and then back on. X:99:□ • Internal error has occurred. → Turn this unit off and then back on.

Caution message

Message	Cause/Corrective Action
MEDIA INCOMPATIBLE	• Displays when inserting an incompatible CompactFlash into this unit. → Use the recommended type of CompactFlash.
FORMAT ERROR	• Displays when not formatting a CompactFlash with this unit etc. → Format the CompactFlash using this unit. * When this message is displayed, press the STOP button on this unit to display the screen for formatting a CompactFlash.
MEDIA ERROR	• The CompactFlash you are using may be damaged. → Check the type you are using.
CLIP NUMBER FULL	• Displays 9999 at the clip number when no more recording is possible. → Delete all of the clips recorded by this unit or format the CompactFlash after copying clips recorded in the CompactFlash to a computer or other suitable media.

If the above symptoms do not improve, try with a different CompactFlash.
If the above symptoms still do not improve even several attempts are made, contact your Sony dealer.

About i.LINK

The i.LINK-logo HDV/DV jack provided on this unit is an i.LINK-compliant jack. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for sending and receiving digital video, digital audio, and other data between this unit and other equipment equipped with an i.LINK terminal. You can also control other equipment using i.LINK.
i.LINK-compatible equipment can be connected using an i.LINK cable. Possible applications are operations and data exchange with various digital AV equipment.
When two or more i.LINK-compatible equipment are connected to this unit, operations and data exchange are possible with equipment directly connected to this unit and also with equipment connected to this unit via other equipment.
Note, however, that the method of operation may vary depending on the characteristics and specifications of the equipment to be connected. Also, there are cases where operations and data exchange may not be possible even if the connection is made.

Notes

- Normally, only one device can be connected to this unit using i.LINK cable. When you connect this unit to HDV/DVCAM (DV)-compliant equipment that allows multiple connections, refer to the operating instructions of the equipment to be connected.
- i.LINK is an easy-to-remember term for the IEEE 1394 proposed by Sony, and is a trademark approved by many corporations in Japan and overseas.
- IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

About the i.LINK baud rate

The maximum baud rate of i.LINK varies depending on the equipment. There are three types.
S100 (Approximately 100 Mbps*)
S200 (Approximately 200 Mbps)
S400 (Approximately 400 Mbps)
The baud rate is listed under "Specifications" in the operating instructions of individual equipment. It may be indicated near the i.LINK interface on some equipment.
The baud rate may vary from the indicated value when this unit is connected to equipment with a different maximum baud rate.

* What is Mbps?
Mbps stands for "megabits per second." It is the volume of data that can be sent or received in 1 second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in 1 second.

To use i.LINK functions of this unit

This unit can be connected to Sony i.LINK-compatible devices other than camcorders (e.g. VAIO computers).
This unit may not be compatible with certain i.LINK video devices such as digital televisions, DVD recorders/players and MICROMV recorders/players even if they are equipped with an i.LINK jack. Before connecting to another device, confirm whether it is HDV/DVCAM (DV) compatible.
For precautions on connecting and the availability of compatible software applications, refer to the operating instructions of the device to be connected.

Notes

- When connecting an i.LINK cable to this unit or a computer, check the direction of the jack. Forcibly inserting the jack may damage the terminal or cause a malfunction.
- Always connect the i.LINK cable to the computer first and then to this unit. Connecting the i.LINK cable to this unit first may cause this unit to malfunction because of static electricity.
- When using an i.LINK cable to connect this unit to a device equipped with an i.LINK jack, switch off the device and remove the power cord from the AC outlet before connecting or disconnecting the i.LINK cable. If the i.LINK cable is connected or disconnected while the power cord of the device is connected to the AC outlet, a high-voltage current (8 to 40 V) output from the i.LINK jack of the device will flow into this unit and damage it.
- Before changing the HDV/DV format etc. of the camcorder, disconnect the i.LINK cable. Changing the format after connecting the i.LINK cable, the video signal may not be recognized correctly.

Required i.LINK cable

Use a Sony i.LINK cable.

i.LINK and i.LINK-logo are trademarks of Sony Corporation.

Optional CompactFlash

CompactFlash

- A CompactFlash 133x 2 GB or higher is recommended for use with this unit. (A speed of less than 133x is not guaranteed; space less than 2GB is not guaranteed.)
- When using a CompactFlash for the first time, be sure to format it with this unit.
- Data may be corrupted or the CompactFlash may not work in the following cases.
  – If you remove the CompactFlash during data reading/writing.
  – If you move the CompactFlash close to a strong magnetic field.
- The CompactFlash may become hot just after use. Handle with care.
- Do not peel the label off the CompactFlash or attach another label to it.
- When storing or carrying the CompactFlash, put it in the protective case supplied.
- Do not get water on the CompactFlash.
- Do not apply excessive force on the label surface of the CompactFlash.
- Do not touch the terminal of the CompactFlash with your hand or any metal object.

Specifications

System

File system	FAT32
CompactFlash	133x 2 GB or more The capacity is the value when 1 GB equals 1 billion bytes. The actual usable capacity may be slightly less because administrative files etc. are included.
File format	HDV recording MPEG-2TS (.m2t) DVCAM/DV recording AVI-Type1 (.AVI) RAW DV (.DV)
Input signal	
HDV recording/playback	
Video:	MPEG-2TS 1080/60i, 30p, 24p 1080/50i, 25p
Audio:	2 CH MPEG 1 Audio Layer2 Stereo (16 bit 48 kHz) (1/2 CH) 4 CH MPEG 2 Audio Layer2 Stereo (16 bit 48 kHz) (3/4 CH)
DVCAM/DV recording/playback	
Video:	DV embedded
Audio:	PCM digital (12/16 bit, 32k, 48k)
Recordable time	2 GB Approx. 9 minutes 4 GB Approx. 18 minutes 8 GB Approx. 36 minutes 16 GB Approx. 72 minutes

General

Power requirement	DC 7.2 V (battery pack) DC 8.4 V (AC adaptor)
Power consumption	2.2 W
Operating temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage temperature	–20 °C to +60 °C (–4 °F to +140 °F)
Operating humidity	20 % (20 °C) to 90 % (35 °C) (no condensation)
Dimensions	
HVR-MRC1 :	Approx. 57 × 102 × 34 mm (2 1/4 × 4 1/8 × 1 3/8 in.)
HVR-MRC1+HVRA-CR1:	Approx. 77 × 106 × 51 mm (3 1/8 × 4 1/4 × 2 1/8 in.) (including the projecting parts) (w/h/d)
Mass	
HVR-MRC1 :	Approx. 130 g (4 oz)
HVR-MRC1+HVRA-CR1:	Approx. 210 g (7 oz) (excluding CompactFlash and battery pack)
Input/output jack	i.LINK (IEEE1394 6-pin connector S400)
Optional accessories	AC adaptor/charger AC-VQ1050B Battery pack NP-F570/F770/F970

Design and specifications are subject to change without notice.

Precautions

On use and care

- Do not use or store this unit and accessories in the following locations.
  - Anywhere excessively hot or cold. Never leave them exposed to temperatures above 60 °C (140 °F), such as under direct sunlight, near heaters or in a car parked in the sun. They may cause malfunction or become deformed.
  - Near strong magnetic fields or mechanical vibration. This unit may cause malfunction.
  - Near strong radio waves or radiation. This unit may not be able to record properly.
  - Near AM receivers and video equipment. Noise may occur.
  - On a sandy beach or anywhere dusty. If sand or dust gets in this unit, the unit may permanently cause malfunction.
  - Near windows or outdoors, where the LCD screen may be exposed to direct sunlight. This damages the LCD screen.
  - Anywhere very humid.
- Operate this unit on DC 7.2 V (battery pack) or DC 8.4 V (AC Adaptor).
- For DC or AC operation, use the accessories recommended in these operating instructions.
- Do not let this unit get wet, for example, from rain or sea water. If this unit gets wet, it may permanently cause malfunction.
- If any solid object or liquid gets inside the casing, unplug this unit and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling, disassembling, modifying, physical shock, or impact such as hammering, dropping or stepping on this unit.
- Keep the POWER switch setting to OFF when you are not using this unit.
- Do not wrap this unit with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- When disconnecting the mains lead, pull it by the plug and not the lead.
- Do not damage the mains lead such as by placing anything heavy on it.
- Keep metal contacts clean.
- If the battery electrolytic liquid has leaked,
  - consult your local authorized Sony service facility.
  - wash off any liquid that may have contacted your skin.
  - if any liquid gets in your eyes, wash with plenty of water and consult a doctor.

■ When not using this unit for a long time

- Use up the battery pack completely before storing it.

LCD screen

- Do not exert excessive pressure on the LCD screen, as it may cause damage.
- If this unit is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using this unit, the back of the LCD screen may heat up. This is not a malfunction.

■ To clean the LCD screen

If fingerprints or dust make the LCD screen dirty, it is recommended you use the LCD Cleaning Cloth (optional) to clean it. When you use the LCD Cleaning Kit (optional), do not apply the cleaning liquid directly to the LCD screen. Use cleaning paper moistened with the liquid.

On handling the casing

- If the casing is soiled, clean this unit body with a soft cloth lightly moistened with water, and then wipe the casing with a dry soft cloth.
- Avoid the following to avoid damage to the finish.
  - Using chemicals such as thinner, benzine, alcohol, chemical cloths, repellent, insecticide and sunscreen.
  - Handling with above substances on your hands.
  - Leaving the casing in contact with rubber or vinyl objects for a long period of time.

Getting the best performance from the battery pack

- If the ambient temperature is low, the battery pack performance deteriorates, reducing the operating time. To maximize the operating time, the following techniques are recommended.
  – Keep the battery pack warm in a pocket, and load it into the unit immediately before shooting.
- The battery is depleted when this unit is in recording standby or playback pause. Always switch off the power supply to save energy.
- Have enough battery packs ready to last two or three times the expected shooting duration, and test shoot with them before the session.
- The battery packs are not waterproof. Be careful not to allow them to get wet.

Indication of remaining battery pack capacity

If the battery pack fails even though the indication suggests there is adequate capacity, fully recharge the battery pack. This will correct the remaining capacity indication. However, if the battery pack is used for a long time at high temperature, is left fully charged, or has been very heavily used, the indication may not be correctly restored. In this case, use the indication time as a rough guideline to estimate the remaining capacity.

Battery pack storage

- If the battery pack is not used for a long time, to maintain its performance, it should be fully charged and then fully discharged with this unit about once a year. Remove the battery pack from this unit, and store in a cool dry place.
- To fully discharge the battery pack with this unit, leave it powered on until the battery pack is exhausted.

Battery pack lifetime

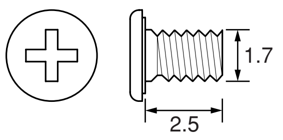
- The battery pack has a limited lifetime. As it is repeatedly used over a long time interval, the capacity gradually reduces. When the operating time is much less than the original value, it is time to replace the battery pack.
- The lifetime varies from one individual battery pack to another, depending on the pattern of use, and how it has been stored.

Additional information on this product and answers to frequently asked questions can be found at our Customer Support Website.

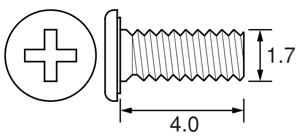
http://www.sony.net/

HARDWARE LIST (1/7)

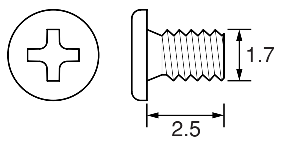
#1: M1.7 X 2.5
(Black)
2-635-562-11



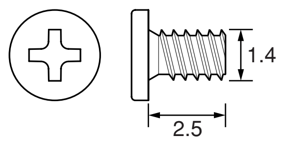
#2: M1.7 X 4.0
(Black)
2-635-562-31



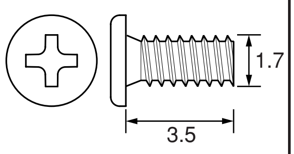
#3: M1.7 X 2.5
(Red)
2-660-401-01



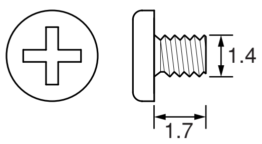
#4: M1.4 X 2.5 (Tapping)
(Dark Silver)
3-348-998-81



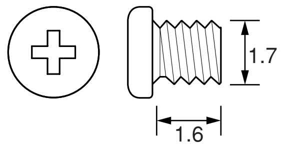
#5: M1.7 X 3.5 (Tapping)
(Black)
3-080-204-01



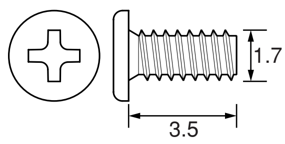
#6: M1.4 X 1.7
(Silver)
2-598-474-01



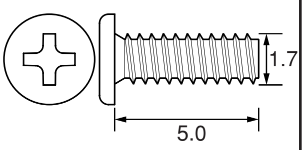
#7: M1.7 X 1.6
(Black)
7-627-552-18



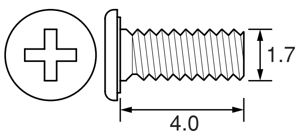
#8: M1.7 X 3.5 (Tapping)
(Silver)
3-078-890-01



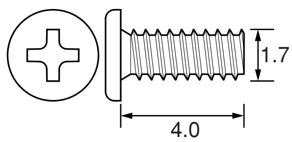
#9: M1.7 X 5.0 (Tapping)
(Silver)
3-078-890-21



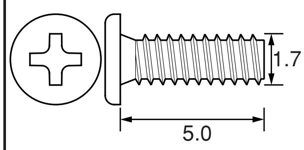
#10: M1.7 X 4.0
(Silver)
2-599-475-31



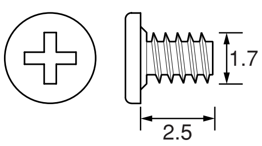
#11: M1.7 X 4.0 (Tapping)
(Silver)
3-078-890-11



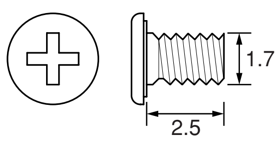
#12: M1.7 X 5.0 (Tapping)
(Black)
3-080-204-21



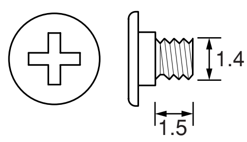
#13: M1.7 X 2.5 (Tapping)
(Silver)
3-085-397-01



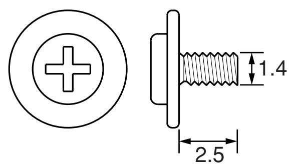
#14: M1.7 X 2.5
(Silver)
2-599-475-11



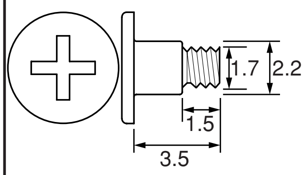
#15: M1.4 X 1.5
(Silver)
3-062-214-01



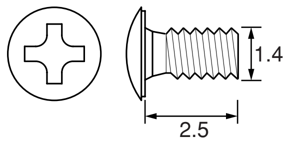
#16: M1.4 X 2.5
(Silver)
2-586-337-01



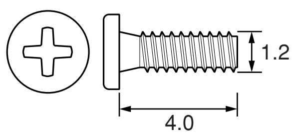
#17: M1.7 X 1.5
(Silver)
2-586-389-01



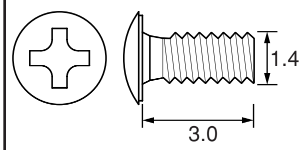
#18: M1.4 X 2.5
(Silver)
2-635-591-21



#19: M1.2 X 4.0 (Tapping)
(Red)
3-086-156-21

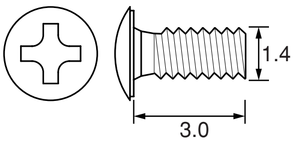


#20: M1.4 X 3.0
(Silver)
2-635-591-31

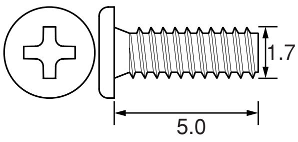


HARDWARE LIST (2/7)

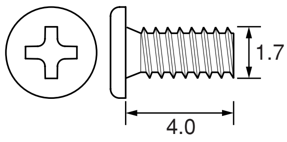
#21: M1.4 X 3.0
(Black)
2-662-396-21



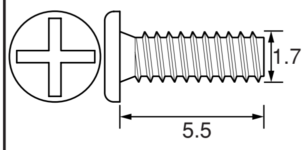
#22: M1.7 X 5.0 (Tapping)
(Silver)
3-083-261-01



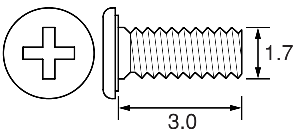
#23: M1.7 X 4.0 (Tapping)
(Black)
3-080-204-11



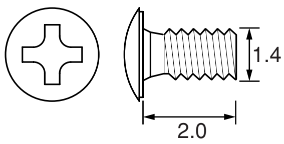
#24: B1.7 X 5.5 (Tapping)
(Black)
4-679-805-11



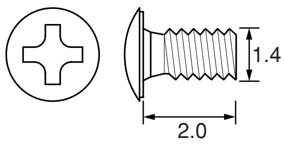
#25: M1.7 X 3.0
(Black)
2-635-562-21



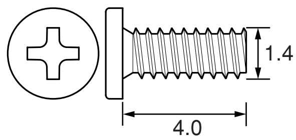
#26: M1.4 X 2.0
(Silver)
2-635-591-11



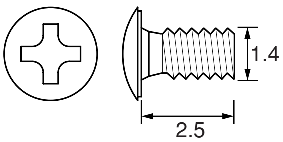
#27: M1.4 X 2.0
(Black)
2-662-396-11



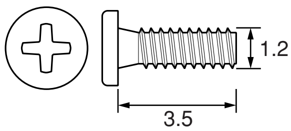
#28: M1.4 X 4.0 (Tapping)
(Silver)
3-348-998-61



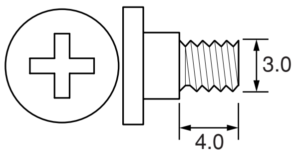
#29: M1.4 X 2.5
(Black)
2-662-396-01



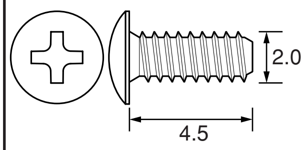
#30: M1.2 X 3.5 (Tapping)
(White)
3-086-156-11



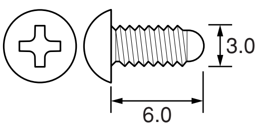
#31: M3.0 X 4.0
(Silver)
2-102-434-01



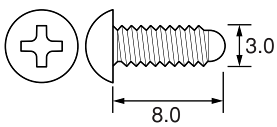
#32: M2.0 X 4.5 (Tapping)
(Silver)
2-102-498-01



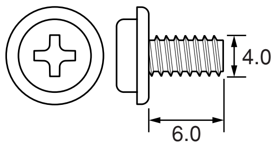
#33: M3.0 X 6.0
(Silver)
3-077-331-21



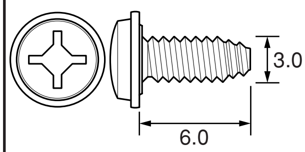
#34: M3.0 X 8.0
(Black)
3-077-331-41



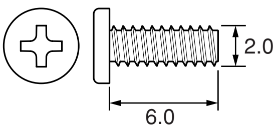
#35: M4.0 X 6.0 (Tapping)
(Silver)
3-975-291-02



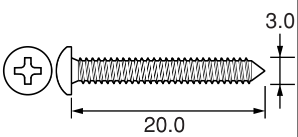
#36: M3.0 X 6.0
(Silver)
4-886-821-11



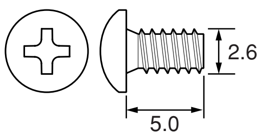
#37: M2.0 X 6.0 (Tapping)
(Black)
3-080-206-31



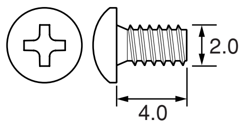
#38: M3.0 X 20.0 (Tapping)
(Silver)
7-685-651-79



#39: M2.6 X 5.0 (Tapping)
(Black)
7-685-791-09

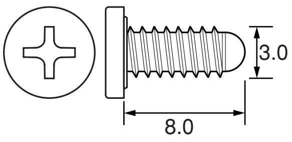


#40: M2.0 X 4.0 (Tapping)
(Silver)
7-685-851-04

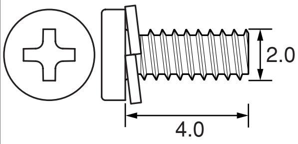


HARDWARE LIST (3/7)

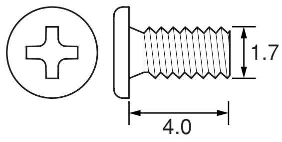
#41: M3.0 X 8.0 (Tapping)
(Silver)
3-065-748-01



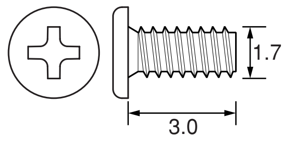
#42: M2.0 X 4.0 (Tapping)
(Silver)
7-628-253-00



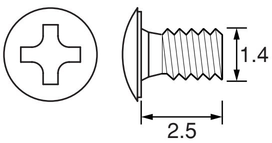
#43: M1.7 X 4.0
(Red)
2-660-401-31



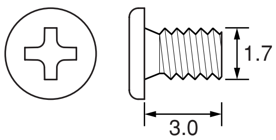
#44: M1.7 X 3.0 (Tapping)
(Silver)
3-078-890-61



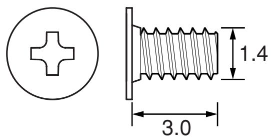
#45: M1.4 X 2.5
(Silver)
2-587-151-01



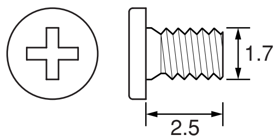
#46: M1.7 X 3.0
(Red)
2-660-401-11



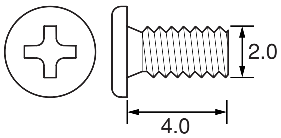
#47: M1.4 X 3.0 (Tapping)
(Silver)
2-665-774-01



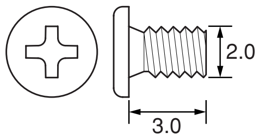
#48: M1.7 X 2.5
(Silver)
3-973-497-91



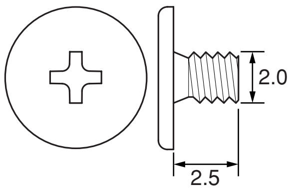
#49: M2.0 X 4.0
(Black)
2-630-005-31



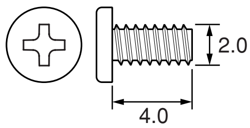
#50: M2.0 X 3.0
(Red)
2-891-494-11



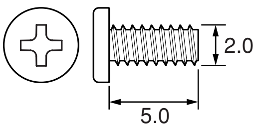
#51: M2.0 X 2.5
(Silver)
3-073-686-01



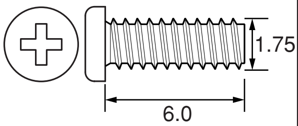
#52: M2.0 X 4.0 (Tapping)
(Black)
3-080-206-11



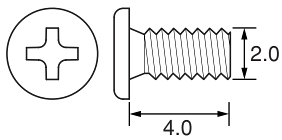
#53: M2.0 X 5.0 (Tapping)
(Black)
3-080-206-21



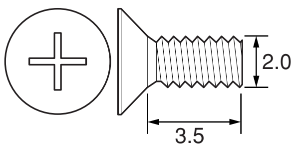
#54: M1.75 X 6.0 (Tapping)
(Black)
3-318-203-11



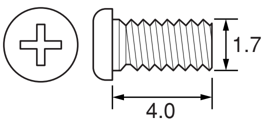
#55: M2.0 X 4.0
(Silver)
2-655-582-11



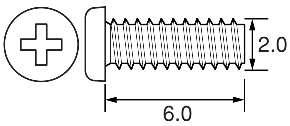
#56: M2.0 X 3.5
(Silver)
3-067-187-11



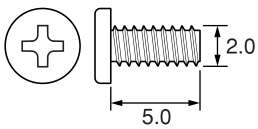
#57: M1.7 X 4.0
(Black)
7-627-852-18



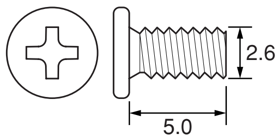
#58: M2.0 X 6.0 (Tapping)
(Silver)
3-719-408-11



#59: M2.0 X 5.0 (Tapping)
(Silver)
3-080-205-21

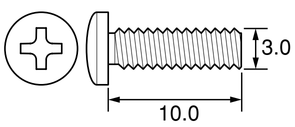


#60: M2.6 X 5.0
(Black)
3-061-062-11

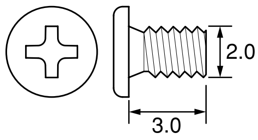


HARDWARE LIST (4/7)

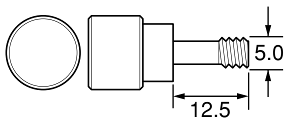
#61: M3.0 X 10.0
(Black)
7-682-549-09



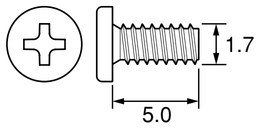
#62: M2.0 X 3.0
(Silver)
3-080-202-21



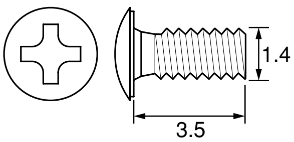
#63: M5.0 X 12.5
(Black)
3-060-811-21



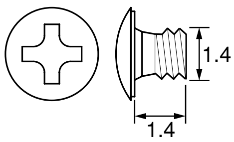
#64: M1.7 X 5.0 (Tapping)
(Silver)
2-666-551-21



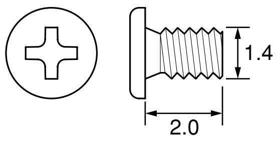
#65: M1.4 X 3.5
(Silver)
2-635-591-01



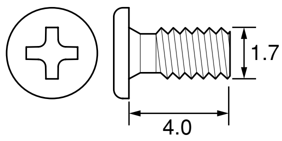
#66: M1.4 X 1.4
(Silver)
2-635-591-41



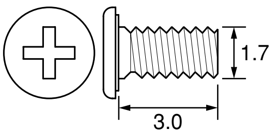
#67: M1.4 X 2.0
(Silver)
3-389-523-16



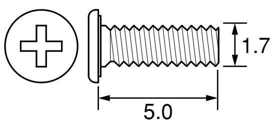
#68: M1.7 X 4.0
(Silver)
2-655-581-01



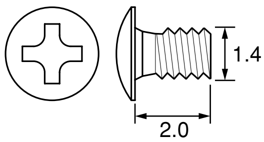
#69: M1.7 X 3.0
(Silver)
2-599-475-21



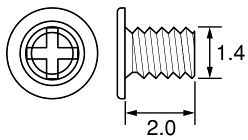
#70: M1.7 X 5.0
(Silver)
2-599-475-41



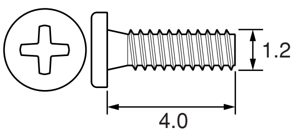
#71: M1.4 X 2.0
(Red)
3-208-537-01



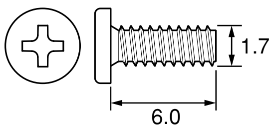
#72: M1.4 X 2.0
(Silver)
4-663-621-41



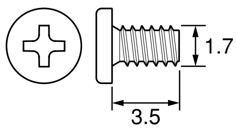
#73: M1.2 X 4.0 (Tapping)
(Black)
3-086-156-61



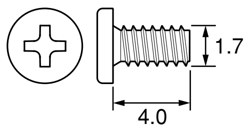
#74: M1.7 X 6.0 (Tapping)
(Silver)
2-666-551-31



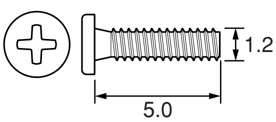
#75: M1.7 X 3.5 (Tapping)
(Silver)
2-666-551-01



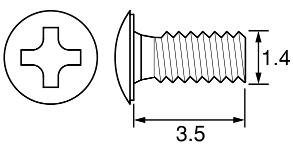
#76: M1.7 X 4.0 (Tapping)
(Silver)
2-666-551-11



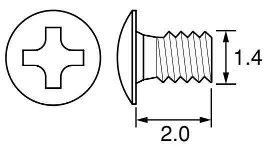
#77: M1.2 X 5.0 (Tapping)
(Silver)
3-086-156-31



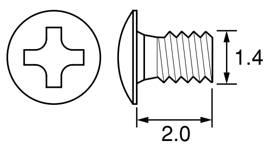
#78: M1.4 X 3.5
(Red)
3-208-537-11



#79: M1.4X 2.0
(Silver)
2-587-151-11

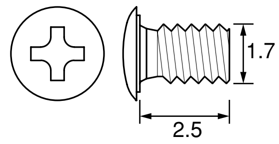


#80: M1.4X 2.0
(Black)
3-279-411-01

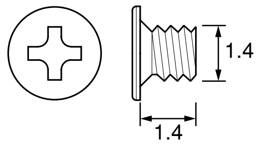


HARDWARE LIST (5/7)

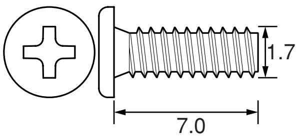
#81: M1.7 X 2.5
(Silver)
2-515-756-01



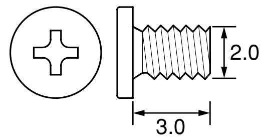
#82: M1.4 X 1.4
(Silver)
3-272-251-01



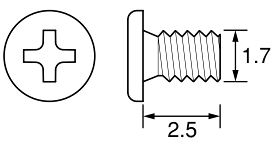
#83: M1.7 X 7.0 (Tapping)
(Black)
3-080-204-41



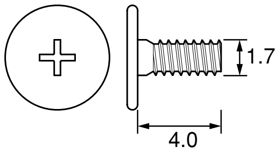
#84: M2.0 X 3.0
(Silver)
3-072-453-11



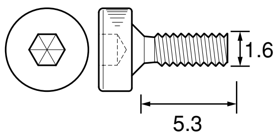
#85: M1.7 X 2.5
(Black)
2-515-483-11



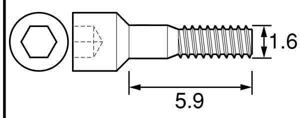
#86: M1.7 X 4.0 (Tapping)
(Silver)
2-695-434-21



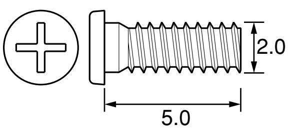
#87: M1.6 X 5.3
(Black)
2-689-328-01



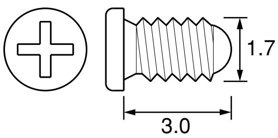
#88: M1.6 X 5.9 (Tapping)
(Silver)
2-689-015-01



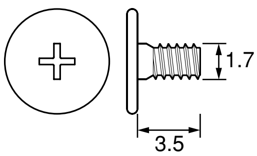
#89: M2.0 X 5.5 (Tapping)
(Silver)
2-695-575-01



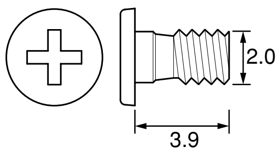
#90: M1.7 X 3.0
(Silver)
3-271-395-01



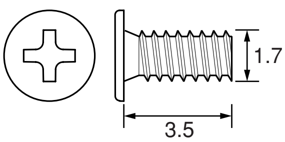
#91: M1.7 X 3.0 (Tapping)
(Silver)
2-695-434-11



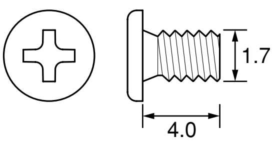
#92: M2.0 X 3.9
(Black)
3-268-954-01



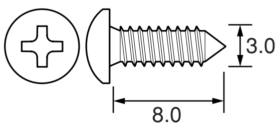
#93: M1.7 X 3.5 (Tapping)
(Silver)
3-254-082-01



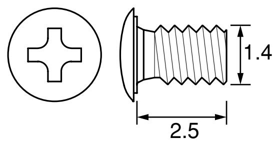
#94: M1.7 X 4.0
(Black)
2-515-483-31



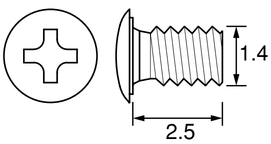
#95: M3.0 X 8.0 (Tapping)
(Black)
7-685-646-79



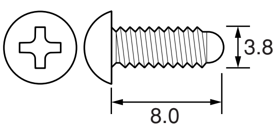
#96: M1.4 X 2.5
(Silver)
2-587-151-21



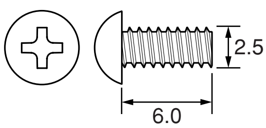
#97: M1.4 X 2.5
(Black)
2-662-396-31



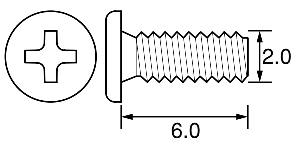
#98: M3.0 X 8.0
(Silver)
3-077-331-01



#99: M2.5 X 6.0 (Tapping)
(Silver)
3-776-750-02

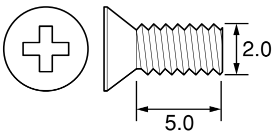


#100: M2.0 X 6.0
(Black)
3-080-203-51

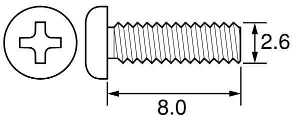


HARDWARE LIST (6/7)

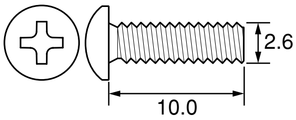
#101: M2.0 X 5.0
(Silver)
7-621-555-39



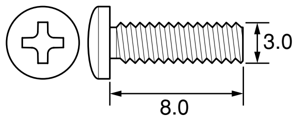
#102: M2.6 X 8.0
(Black)
7-621-284-30



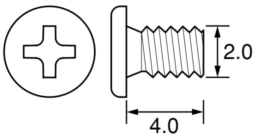
#103: M2.6 X 10.0
(Silver)
7-685-794-09



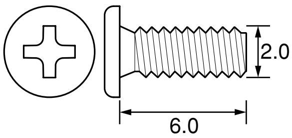
#104: M3.0 X 8.0
(Black)
7-682-548-09



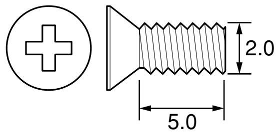
#105: M2.0 X 4.0
(Red)
2-891-494-31



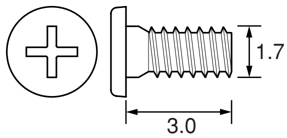
#106: M2.0 X 6.0
(Black)
3-713-786-11



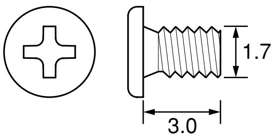
#107: M2.0 X 5.0
(Silver)
3-032-750-01



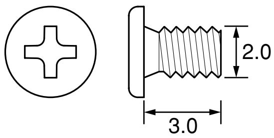
#108: M1.7 X 3.0 (Tapping)
(Black)
2-695-430-01



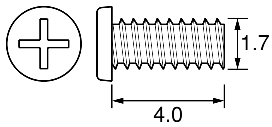
#109: M1.7 X 3.0
(Black)
2-515-483-21



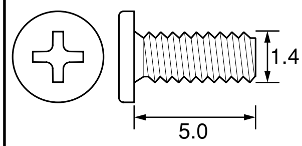
#110: M2.0 X 3.0
(Black)
2-630-005-21



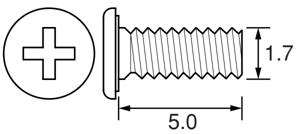
#111: M1.7 X 4.0 (Tapping)
(Black)
2-887-124-01



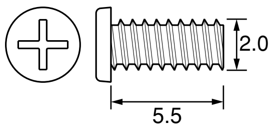
#112: M1.4 X 5.0
(Black)
2-178-410-11



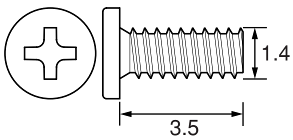
#113: M1.7 X 5.0
(Black)
2-635-562-41



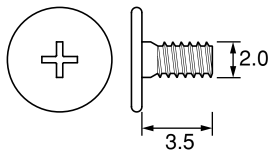
#114: M2.0 X 5.5 (Tapping)
(Silver)
2-698-464-01



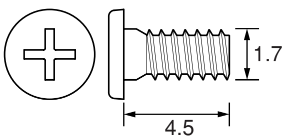
#115: M1.4 X 3.5 (Tapping)
(Silver)
3-348-998-51



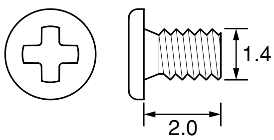
#116: M2.0 X 3.5 (Tapping)
(Silver)
2-695-435-01



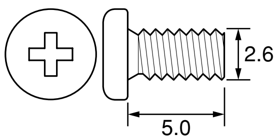
#117: M1.7 X 4.5 (Tapping)
(Silver)
2-695-429-31



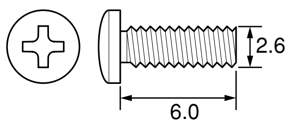
#118: M1.4 X 2.0
(Black)
2-655-580-01



#119: M2.6 X 5.0
(Black)
7-627-556-58

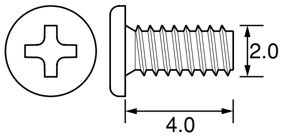


#120: M2.6 X 6.0
(Silver)
7-621-770-67

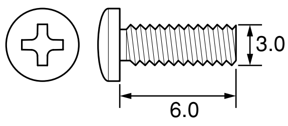


HARDWARE LIST (7/7)

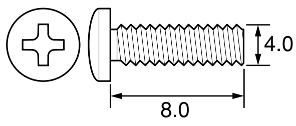
#121: M2.0 X 4.0 (Tapping)
(Silver)
3-080-205-11



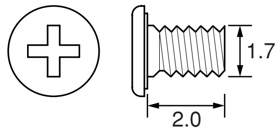
#122: M3.0 X 6.0
(Black)
7-682-547-09



#123: M4.0 X 8.0
(Black)
7-682-561-09



#124: M1.7 X 2.0
(Silver)
2-599-475-01



Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2008.01	Official Release	—	—
1.1	2008.06	Revised-1 (A1 DI08-162)	• Change of Repair Parts S.M. revised: Page 5-5, Page 5-6, Page 5-7	Yes
1.2	2009.03	Revised-2 (A2 DI08-386)	• Change of Repair Parts S.M. revised: Page 5-2, Page 5-3, Page 5-4, Page 5-5, Page 5-7	Yes